



PATHOLOGY HANDBOOK

VER 6.2

2025



DEPARTMENT OF PATHOLOGY
HOSPITAL SULTANAHAMINAH
JOHOR BAHRU

FOREWORD

Director Of Hospital Sultanah Aminah

Pathology services are vital components of diagnostic services that are used in the diagnosis, prognosis, and management of diseases. I am jubilant that the Department of Pathology has successfully published the sixth edition of its Pathology Handbook 2025.

This comprehensive handbook has proven to be a critical tool, focusing on the test schedules and types of tests available across various disciplines of the Pathology Department which will be used by our clinicians and others especially in our hospital, District hospitals and Health facilities in the state of Johor as well as other facilities throughout Malaysia.

I sincerely hope that this handbook will help to propel our medical service towards the improvement of our diagnostic services, which aim to provide quality and accurate results efficiently, thereby improving patient care, management and prognosis. I would like to express my heartfelt congratulations to the Head of the Department of Pathology and the entire pathology team on the successful publication of the handbook. I also hope that this handbook will be useful for making the best use of the laboratory in the near future.

DR MOHAMAD NIZAM BIN HJ. SUBAHIR



FOREWORD

Head of Pathology Department Hospital Sultanah Aminah

It is with great pride and commitment that we present the Pathology Handbook, Sixth Edition 2025, a comprehensive guide designed to support our team, clinicians, and healthcare partners in delivering quality diagnostic services. As being MS ISO 15189 accredited laboratory, this handbook represents the collective expertise and dedication of our department, aiming to provide accessible, accurate, and timely diagnostic information that are vital to patient care.



Pathology plays a crucial role in clinical decision-making, and our work serves as the cornerstone of accurate diagnosis and effective treatment planning. In this guide, we have outlined and updated comprehensive specimen handling requirements, test schedule with turnaround time including additional new tests, and best practices that uphold the highest standards of quality and safety. Each section has been crafted with attention to detail, user friendly format to facilitate quick access to crucial information, reflecting our unwavering dedication to precision and continuous improvement.

I would like to extend my sincere gratitude to the entire pathology team for their hard work, collaboration, and commitment to excellence. Your expertise and professionalism drive the success of our department and elevate the quality of care we provide. It is our hope that this handbook will serve as a valuable resource in enhancing our ability to work efficiently and cohesively. May it guide us in our shared mission to deliver accurate, reliable, and compassionate care to every patient we serve.

DR NORAIDA BINTI KHALID

ADVISOR

DR NORAIDA BINTI KHALID

Head of Department & Senior Consultant Pathologist (Anatomic Pathology) Gred Khas C
Department of Pathology HSAJB, Johor

CO-ORDINATOR

MOHD ZAMRI BIN ABDUL RAHMAN

Scientific Officer (Biomedical) C10, Department of Pathology HSAJB, Johor

DRAFTING COMMITTEE

Haematology : Wong Tiffany Sheau Mei, Scientific Officer (Biomedical) C10

Microbiology : Dr Nur Afiza Binti Aziz, Pathologist (Medical Microbiology) UD14

Chemical Pathology : Nur Afftieeah Binti Othman, Medical Lab Technologist U6

Anatomic Pathology : Dr Jayanthi A/P Jeyaverasingam, Pathologist (Anatomic Pathology) UD14

Clinical Laboratory : Izzati Binti Safiee, Scientific Officer (Biochemist) C9

Special Thanks To

All Personnel of Pathology Department, Hospital Sultanah Aminah Johor Bahru

CONTENT	PAGE
Abbreviation	1
Organisation Chart	3
Introduction	4
Vision, Mission, Objectives	5
Client Charter	6
Location	7
Scope of service & Operating Hours.....	8
The list of Units/Laboratories telephone number(s)	9
Microbiology Unit – Containers Used in Microbiology Lab	10
The list of Bacteriology Tests	24
The list of Mycology Tests	31
The list of Parasitology Tests	33
The list of Serology Tests	34
The list of Immunology Tests	36
The list of Virology Tests	38
The list of Molecular Tests	42
The list of Mycobacteriology Tests	47
Microbiology Unit – List of Microbiology tests offered by the Reference Laboratories	49
Haematology Unit - List of tests offered at the Haematology Laboratory	88
List of Haematology Tests offered for 24 hours services	88
Routine Haematology Test	89
Specialised Haematology Tests	90
Haematology Unit - List of test offered by the Reference Laboratories	95
List of Haematology Tests Offered In Hospital Ampang	95
List of Haematology Tests Offered In Hospital Kuala Lumpur (HKL).....	98
List of Haematology Tests Offered In Hospital Tunku Azizah Kuala Lumpur (HTA)	99
List of Haematology Tests Offered At Institute Of Medical Research(IMR)	101
List of Haematology Tests Offered At Hospital Melaka	103
List of Haematology Tests Offered At Hospital Sultanah Bahiyah, Kedah	104
Anatomic Pathology Unit – Histopathology	106
Anatomic Pathology Unit – Cytopathology	113
Anatomic Pathology Unit – List of tests offered during office hours only	119
List of tests offered at Histopathology Laboratory	119
List of tests offered at Cytology Laboratory	121
Anatomic Pathology Unit – List of tests offered by Reference Laboratories	125

CONTENT	PAGE
Clinical Laboratory – List of tests offered	127
Chemical Pathology Tests	127
Haematology Tests	132
Urinalysis Tests	132
Chemical Pathology Unit – List of tests offered at Chemical Pathology Unit Laboratory ..	133
List of tests offered at the Biochemistry Laboratory	133
List of tests offered at the Drug Laboratory	159
Chemical Pathology Unit – List of tests offered by the Reference Laboratories	161
List of Chemical Pathology tests offered in Hospital Ampang	162
List of Chemical Pathology tests offered in Hospital Kuala Lumpur (HKL)	163
List of Chemical Pathology tests offered in Hospital Permai Johor Bahru (HPJB)..	170
List of Chemical Pathology tests offered in Hospital Putrajaya (HPJ)	171
List of Chemical Pathology tests offered in Hospital Selayang (HSEL)	172
List of Chemical Pathology tests offered in Hospital Tunku Azizah, Kuala Lumpur (HTA)	173
List of Chemical Pathology tests offered in Institut Kanser Negara, Putrajaya (IKN)	175
List of Chemical Pathology tests offered in Jabatan Kimia, Johor	176
List of Chemical Pathology tests offered in Makmal Kesihatan Awam Johor Bahru (MKAJB)	177
List of Chemical Pathology tests offered in Makmal Kesihatan Awam Kebangsaan, Sungai Buloh (MKAK)	178
List of Chemical Pathology tests offered in Institute for Medical Research, Kuala Lumpur (IMR)	179
The list Officers Contact Number(s).....	203
Administration.....	203
Chemical Pathology	203
Microbiology	205
Hematology	207
Anatomic Pathology	208
Clinical Laboratory	210
Laboratory Rejection Criteria In Pathology Department HSAJB.....	211
Enquiries or Feedback	215
Attachment	216
Lampiran A: Kriteria Penghantaran Untuk Ujian CD4/CD8	216
Lampiran B: Garis Panduan Ujian CD4/CD8	217
Lampiran C: Kriteria Untuk Ujian Bone Marrow Aspiration (BMA)	218
Lampiran D: Kriteria Untuk Ujian Hb Analisis Di Makmal Hematologi, HSAJB	219
Lampiran E: Kriteria Untuk Ujian Immunophenotyping	220

CONTENT	PAGE
Lampiran F: Kriteria Permohonan Ujian Factor VIII / IX / Inhibitor Assays	221
Lampiran G: Kriteria Penghantaran Ujian Lupus Anticoagulant (LA)	222
Lampiran H: Checklist For Thrombophilia Testing	223
Lampiran I: Kriteria Untuk Ujian Molecular Quantitation Of Major BCR-ABL1 (P210) For Chronic Myeloid Leukaemia (CML) Patients	224
Lampiran J: Kriteria Penghantaran Untuk Ujian Minimal Residual Disease (MRD)	225
Lampiran K: Borang PER-PAT 301	226
Lampiran L: Borang IMR - Endocrine Request Form, Endocrine Unit	227
Lampiran M: Borang IMR - Request Form for Molecular Diagnostics Services, Unit of Molecular Diagnostics	228
Lampiran N: Borang IMR - Request Form for Unit Protein Khas	229
Lampiran O: Borang IMR - IEM Request Form, Biochemistry Unit	230
Lampiran P: Borang Permohonan Ujian Molekular, Hospital Tunku Azizah, Kuala Lumpur	231
Lampiran Q: Borang Permohonan Ujian IEM, Hospital Tunku Azizah, Kuala Lumpur	232
Lampiran R: Borang Permohonan Ujian Makmal MKAK, Sg Buloh	233
Lampiran S: Borang Jabatan Kimia, Malaysia	234
Lampiran T: Borang PAP smear PS 1/98 (Pindaan 2019)	235
Lampiran U: Borang PAP smear PS 1/98 (Pindaan 2007)	236
Lampiran V: Borang Tuntutan Sample	237
Lampiran W: Borang Permintaan Bahan Makmal	238
Lampiran X: Consent from Clinical Post-Mortem Examination	239
Lampiran Y: Borang Penghantaran Specimen Hospital Daerah/ Klinik Kesihatan Ke Jabatan Patologi, HSAJB	242

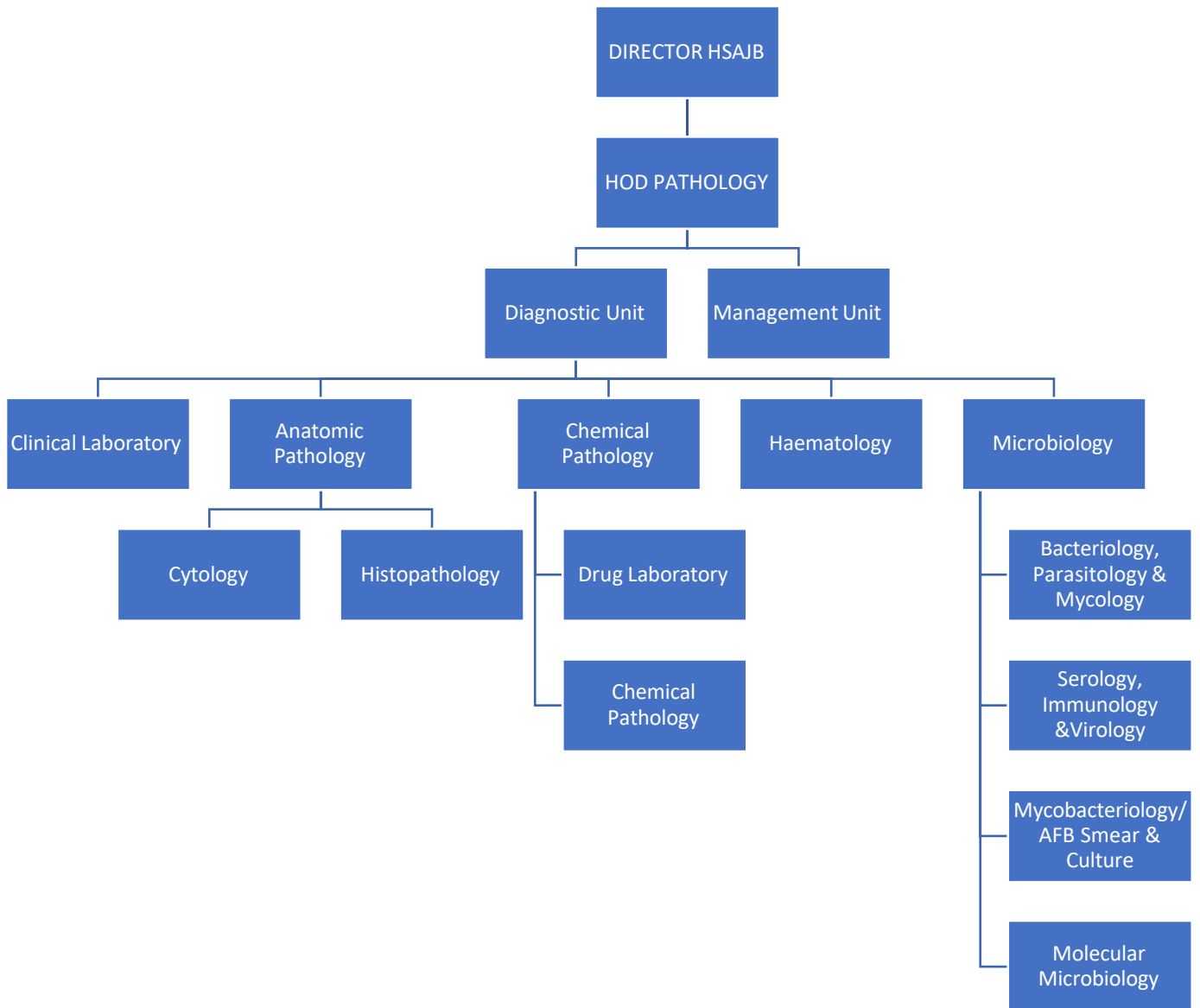
ABBREVIATION

17-OHP	17 Hydroxy Progesterone	CE	Cardiac Enzymes
5-HIAA	5-Hydroxyindoleacetic Acid	CEA	Carcinoembryoni c Antigen
ACL	Anti Cardiolipin	CISH	Chromogenic in situ hybridisation
ACTH	Adrenocorticotropi c Hormone	CK	Creatine Kinase
AFB	Acid Fast Bacilli	CMV	Cytomegalovirus
AIRC	Allergy And Immunology Research Centre	CPC	Clinicopathological Conference
ALP	Alkaline Phosphatase	CRP	C-Reactive Protein
ALT	Alanine Transaminase	CSF	Cerebrospinal Fluid
ANCA	Anti-Neutrophil Cytoplasmic Antibody	CVC	Central Venous Catheter
Apo	Anti Phospholipid	DI	Diabetes Insipidus
APTT	Activated Partial Thrombin Time	DIVC	Disseminated Intravascular Coagulation
ASL	Arginino-succinate Lyase Deficiency	dsDNA	Double Stranded DNA
ASOT	Anti Streptolysin-O Titer	DST	Dexamethosone Supression Test
AST	Aspartate Transminase	EBV	Epstein Barr Virus
ATG	Anti Thyroglobulin	eGFR	Estimated Glomerular Filtration rate
ATS	Amphetamine Type Stimulants ti	ENA	Extractable Nuclear Ag
BAL	Bronchio-Alveolar Lavage	ESR	Erythrocytic Sedimentation Rate
BBA	Blind Bronchial Aspirate	FAI	Free Androgen Index
BFMP	Blood film for Malaria	FBC	Full Blood Count
BhCG	Beta Human Chorionic Gonadotropin	FBP	Full Blood Picture
BMA	Bone Marrow Aspirate	FISH	Fluorescence In Situ Hybridization
BTd	Biotinidase Deficiency	FNAC	Fine Needle Aspiration Cytology
BTK	Bruton Tyrosine Kinase	FS	Frozen Section
C&S	Culture And Sensitivity	FSH	Follicle Stimulating Hormone
CA 15-3	Cancer Antigen 15-3	FT3	Triiodothyroxine, Free
CA 19-9	Cancer Antigen 19-9	FT4	Thyroxine, Free
CA125	Cancer Antigen 125	g	gram
CBS	Classical Homocystin-uria	HBcAb	Hepatitis B Virus Total Core
CDNRC	Diabetes Endocrine Unit, IMR	HBeAb	Hepatitis B Virus envelope Antibody

ABBREVIATION

HBeAg	Hepatitis B Virus envelope Antigen	Mg	Magnesium
HbsAb	Hepatitis B Virus surface Antibody	MKAJB	Makmal Kesihatan Awam Johor
HBsAg	Hepatitis B Virus surface Antigen	MKAK	Makmal Kesihatan Awam Kebangsaan
HCl	Hydrochloride Acid	ml	mililiter
HIV	Human Immunodeficiency Virus	MO	Medical Officer
HKL	Hospital Kuala Lumpur	MPA	Mycophenolic Acid
HPJB	Hospital Permai Johor Bahru	MPS	Mucopolysaccharides
HTA	Hospital Tunku Azizah	MSU	Mid Stream Urine
HSAJB	Hospital Sultanah Aminah, Johor Bahru	N/A	Not Applicable
HSB	Hospital Sungai Buluh	NBF	Neutral Buffered Formalin
HSEL	Hospital Selayang	OFT	Osmotic Fragility Test
HSI	Hospital Sultan Ismail, Johor Bahru	PA	Particle Agglutination
ID	Identification	PCR	Polymerase Chain Reaction
IF	Immunofluorescence	PDN	Pusat Darah Negara
IgA	Immunoglobulin A	PNH	Paroxysmal Nocturnal Haemoglobinuria
IgG	Immunoglobulin G	PSA	Prostate Specific Antigen, Free
IgM	Immunoglobulin M	PT	Protrombin Time
Ili	Influenza Like Illness	RF	Rheumatoid Factor
IKN	Institut Kanser Negara	RL	Reference Laboratory
IMR	Institute Of Medical Research	RLTAT	Reference Laboratory Turn Around Time
IPT	Immuno-phenotyping	RSV	Respiratory Syncytial Virus
iPTH	Parathyroid Hormone, Intact	SFUC	Surgical Follow-up Clinic
ISH	In Situ Hybridization	SHBG	Sex Hormone Binding Globulins
Je	Japanese Encephalitis	STAT	Urgent/Immediately
KKM	Kementerian Kesihatan Malaysia	TAT	Turn Around Time
KSS	Kearns-Sayre Syndrome	TDM	Therapeutic Drug Monitoring
l or L	liter	TPN	Total Parenteral Nutrition
LAB/lab	Laboratory	TSB	Total Serum Bilirubin
LDH	Lactate Dehydrogenase	TSH	Thyroid Stimulating Hormone

ORGANIZATION CHART



INTRODUCTION

The Department of Pathology henceforth referred to simply as the laboratory is a part of Hospital Sultanah Aminah and a government laboratory under the purview of Ministry of Health (MOH) Malaysia. It is an entity that can be held legally responsible for its activities.

The laboratory is directed by a qualified and competent pathologist who is responsible for the overall laboratory operations. Human resources in the laboratory include pathologists, medical officers, science officers, medical laboratory technologists, clerical staffs and healthcare assistants.



Hospital Sultanah Aminah is a government hospital and categorized as a major specialist hospital. Patients are also referred from government clinics, private clinics and government hospitals in the state of Johor. The majority of patients are in-patients. It also serves out-patients at the Emergency and Trauma Department and Specialist Clinics.

VISION

Providing immediate and accurate clinical service to all clients with regards to patient care management

MISSION

- To provide clinical laboratory service to all clients according to excellent practices by using appropriate laboratory technology.
- To ensure all laboratory tests are done according to documented procedures.
- To assure that all laboratory staff are competent, prompt and adhere to standard laboratory policies and procedures as documented in the laboratory quality manual and all relevant documents at all times.
- To provide laboratory quality management system according to ISO 15189:2022 standards.

OBJECTIVES

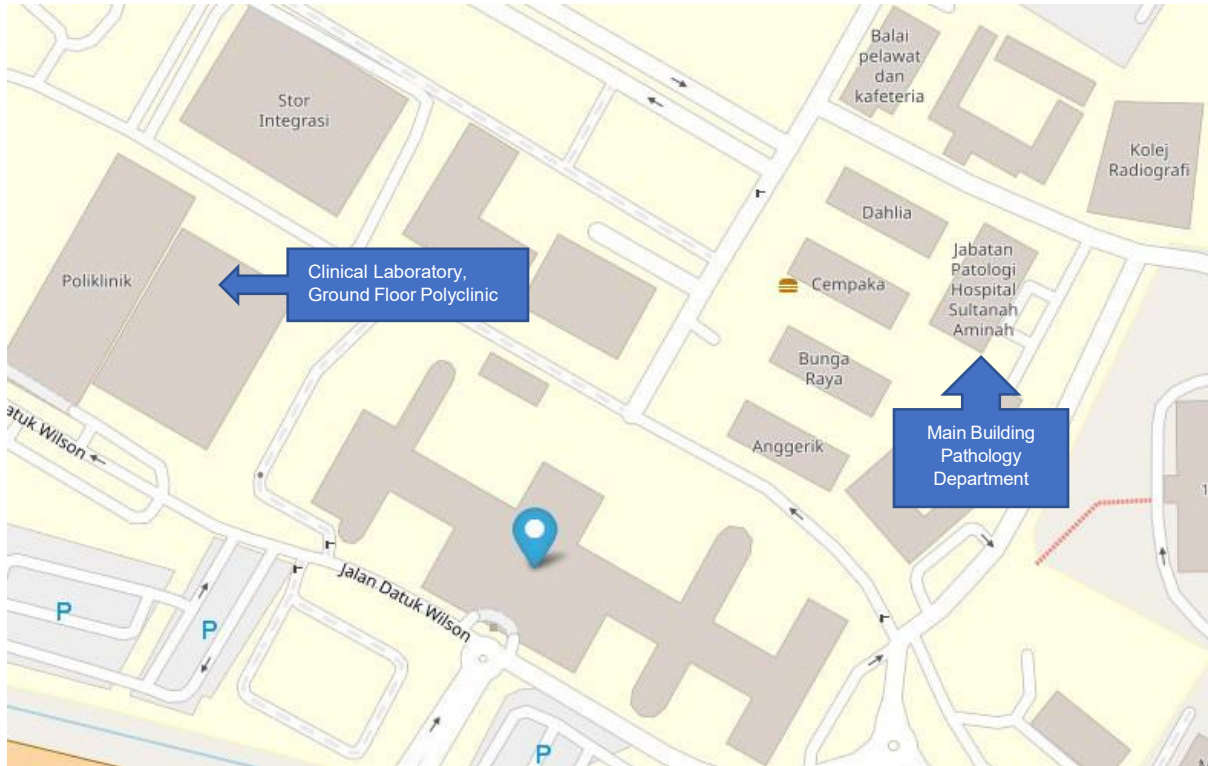
- To provide efficient, reliable and accurate diagnostic services for HSAJB and all Clinical and Health Departments in the state of Johor.
- To provide pathology consultancy service for all Clinical Departments and State Health department.
- To provide tertiary consultancy services for available subspecialities at national level.
- To provide excellent pathology services as the State's Laboratory Reference Centre.
- To provide quality training for all medical staff from public hospitals, local and foreign institutions of higher learning.

CLIENT CHARTER

- To provide our clients with clear & complete information on all laboratory tests.
- To process our specimens with recommended test procedures.
- To perform laboratory tests with accuracy, efficiency, reproducibility and utmost care by using approved laboratory methods and state of the art laboratory technology.
- To run STAT/URGENT samples immediately within the stipulated turn-around time.
- To handle client's results and information with strict confidentiality.



LOCATION



The building Department of Pathology is located at behind Block Dahlia, adjacent to the Bangunan Lili & Kolej Radiografi. The department provides medical laboratory diagnostic and consultation services to the entire clinical services in the hospital and external health facilities. Visitors and users can access the laboratory via the main entrance. Access to the working areas in the laboratory is limited to the laboratory personnel and authorized personnel.

These functional units are located in the following areas:

Unit	Location
Management	Ground Floor
Chemical Pathology Lab	Level 1
Drug Lab	
Haematology Lab	Level 2
Molecular Lab	
Microbiology Lab	Level 3
Serology Lab	
Mycobacteriology Lab	
Histopathology Lab	Level 4
Cytology Lab	
Clinical Lab	Ground Floor Polyclinic

SCOPE OF SERVICES

The department of pathology comprised 5 major laboratories which are listed as follows:

- Medical Microbiology Laboratory (Bacteriology, Serology & Immunology, Mycobacteriology and Molecular)
- Anatomic Pathology Laboratory (Histopathology and Cytology)
- Hematology Laboratory
- Chemical Pathology Laboratory & Drug Laboratory
- Clinical Laboratory

OPERATING HOURS

Office hours:

Monday – Friday 8.00 am – 5.00 pm

On call duties:

Monday – Friday 5.00 pm – 8.00 am

Saturday - Sunday	8.00 am – 8.00 pm	} Chemical Pathology, Medical Microbiology and Haematology Laboratories
	8.00 pm – 8.00 am	




24 hours services:

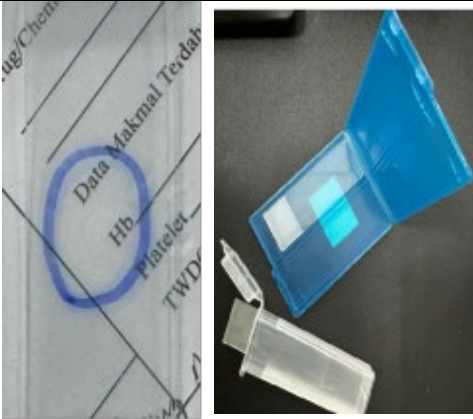
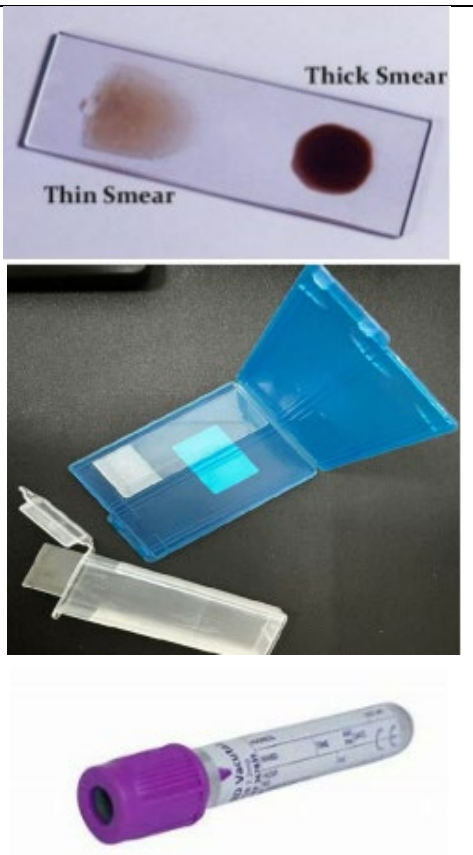
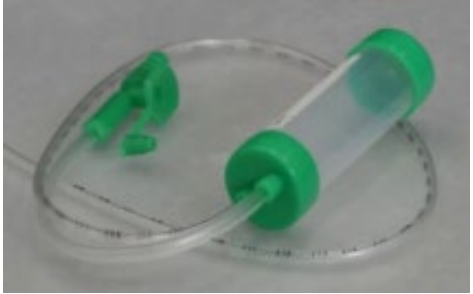
Certain test are offered in Chemical Pathology, Medical Microbiology (Bacteriology) and Hematology Laboratories. Refer detail in respective sections.





THE LIST OF UNITS/ LABORATORIES TELEPHONE NUMBERS





	Head of Department • Ext 2678
	Pathology administration • Ext 2631
	Quality Manager • Ext 1201
	Head of Chemical Pathology Unit • Ext 1633
	Chemical Pathology Laboratory • Ext 2630
	Drug Laboratory • Ext 1111
	Head of Microbiology Unit • Ext 2660
	Bacteriology Laboratory • Ext 1302/2629
	Serology & Immunology Laboratory • Ext 1363
	Mycobacteriology Laboratory (TB Lab) • Ext 2913
	Molecular Laboratory • Ext 2670/1209
	Head of Haematology Unit • Ext 1614
	Haematology Laboratory • Ext 2362/1207/2277
	Head of Anatomic Pathology Unit • Ext 2941
	Histopathology Laboratory • Ext 2364/2666
	Histopathologist in-charge of Cytology Laboratory • Ext 2360
	Cytology Laboratory • Ext 2795/2666
	Head of Clinical Laboratory Unit • Ext 2646
	Clinical Laboratory • Ext 2618







CONTAINERS USED IN MICROBIOLOGY



Tube/ container Description	Tube / Container	Common Use	Special Instruction
BACTERIOLOGY			
<p>Sterile-container with BORIC ACID (preservative)</p>		<p>Urine C+S</p>	<p>Must fill up until the indicator line mark. Sample will be rejected if below <20ML (insufficient) or above (overload) the indicator line mark.</p> <p>For urine samples, the sample MUST be sent to the lab within 24 hours from collection.</p>
<p>Sterile-container WITHOUT preservative (i.e: Boric Acid)</p>		<p>Urine C+S Sputum C+S Sputum AFB Sputum TB C+S Sputum Fungal C+S BAL C+S BAL AFB BAL TB C+S Gastric lavage AFB Gastric lavage TB C+S Body fluid C+S Body fluid fungal C+S Tissue C+S Tissue Fungal C+S Pus C+S Pus C+S Bone C+S Bone Fungal C+S Stool C+S</p>	<p>For urine samples, the sample MUST be sent to the lab within 4 hours from collection.</p>
<p>Sterile container with scoop</p>		<p>Stool C+S Stool for rotavirus Stool for C. diff Ag Stool for Ova & Cyst Others (Stool for outsource)</p>	<p>Please refer to specific test sections in this handbook and/or reference laboratory guidelines for sample criteria.</p>

<p>Glass slide & slide box/mailer</p>		<p>Corneal scraping/conjunctival scraping for microscopy (Gram stain or KOH stain)</p>	<p>Please collect the glass slide & slide box/mailer from the counter of microb lab</p>
<p>Glass slide & slide box/mailer or EDTA tube</p>		<p>Blood film malaria parasite (BFMP)/Blood film for microfilariae</p>	<p>Please collect the glass slide & slide box/mailer from the Microbiology laboratory counter.</p> <p>Please prepare thick and thin smears properly. Poor quality smears will be rejected.</p>
<p>NPA/TA/BBA suction container</p>		<p>NPA C+S TA/BBA C+S NPA fungal C+S TA/BBA fungal C+S NPA AFB NPA TB C+S TA/BBA AFB TA/BBA TB C+S</p>	

			
<p>Bijou glass bottle or disposable conical transport</p>		<p>CSF C+S CSF fungal C+S CSF TB C+S</p>	<p>Collect the bottle from Microb lab prior to the sampling. To inform the lab staff if bijou glass bottle is needed.</p> <p>NEVER REFRIGERATE THE CSF SAMPLE.</p>
<p>Blood culture bottles- Adult</p> <p>to detect and recovery of both aerobic and anaerobic organisms</p>		<p>Blood C+S Aerobic (grey) Anaerobic (purple)</p>	<p>NEVER REFRIGERATE THE SAMPLE.</p>
<p>Blood culture bottle- (BD BACTEC™ Peds Plus/F culture vials)</p> <p>Suitable for isolation of aerobic microorganisms (mainly bacteria and yeast) from pediatric blood specimens which are generally less than 5ml in volume.</p>		<p>For pediatric patient Blood C+S</p>	<p>NEVER REFRIGERATE THE SAMPLE.</p>

<p>Blood culture bottle- (BACTEC™ Myco/F Lytic Culture Vials)</p> <p>support the better growth recovery of mycobacteria, yeast, and fungi from blood specimens</p>		<p>TB Blood C+S Fungal Blood C+S</p>	<p>NEVER REFRIGERATE THE SAMPLE.</p>
<p>Amies-charcoal swab transport medium</p> <p>Support in recovery aerobes, anaerobes; charcoal neutralizes bacterial toxins and inhibitory substances. Used to recover <i>Neisseria gonorrhoeae</i></p>		<p>MRSA screening swab C+S CRE screening swab C+S HVS C+S Wound swab C+S Pus swab C+S Throat swab C+S Genital C+S Urethral swab C+S Endocervical swab C+S</p>	
<p>Cary-blair transport medium (rectal swab)</p> <p>(for better isolation of <i>Salmonella</i>, <i>Shigella</i>, <i>Vibrio</i>, <i>Yersinia</i>)</p>		<p>Rectal swab C+S</p>	
<p>SEROLOGY</p>			
<p>Plain Tube</p>		<p>All serology tests</p>	

<p>Sterile container (NPA/BAL/ induced sputum)</p>		<p>NPA viruses IF BAL/induced sputum for PCP IF</p>	
MOLECULAR			
<p>Monkey pox swab kit (Nylon swab & VTM)</p>		<p><u>Monkey pox specimen:</u> Lesion fluid swab Nasopharyngeal swab Tonsillar tissue swab</p>	<p>Please consult microbiologist oncall to request test</p>
<p>Oropharyngeal/ nasopharyngeal Nylon swab + Viral transport medium (VTM)</p>		<p>Influenza PCR SARS-CoV-2 PCR Respiratory viruses PCR/isolation MERS-CoV PCR (Must combined both nasopharyngeal & oropharyngeal swabs)</p>	<p>Please consult microbiologist oncall to request test</p>
<p>EDTA tube (purple)</p>		<p>Viral load PCR (i.e: HIV, HEP B, HEP C, CMV, BKV, EBV)</p>	
<p>Sterile container (Respiratory samples, urine)</p>		<p>TB gene-expert (MTB/RIF) STD panel PCR (urine)</p>	
<p>CSF (bijou glass bottle or disposable conical transport tube)</p>		<p>QIAstat-Dx® Meningoencephalitis (ME) Panel CSF VIRUSES PCR or viral isolation (HSV/VZV/BK/EBV/ JE/ZIKA/dengue/ enterovirus/</p>	<p>Collect the bottle from Microb lab prior to the sampling. To inform the lab staff if bijou glass bottle is needed. NEVER</p>

		<p>parvovirus/ SARS-CoV-2 etc)</p>	<p>REFRIGERATE THE SAMPLE.</p> <p>SEND THE SAMPLE IMMEDIATELY TO THE LAB</p> <p>Please consult microbiologist oncall to request QIAstat-Dx® Meningoencephal itis (ME) Panel</p>
<p>Oropharyngeal/ nasopharyngeal Nylon swab + Universal transport medium (UTM)</p>		<p>QIAstat-Dx Respiratory Panel</p>	<p>Please consult microbiologist oncall to request test.</p>

TATACARA PENYEDIAAN SLAID BLOOD FILM FOR MALARIA PARASITE (BFMP)



SAMPLE COLLECTION FOR MICROBIOLOGY TESTS

BACTERIOLOGY TESTS (Includes fungal and TB)	
Autopsy material for culture	<p>Blood</p> <ul style="list-style-type: none"> Aspirate 10 mls of blood from the right heart either through skin and chest wall or through an unopened heart from the right ventricle into blood culture bottles or sterile tubes. Avoid contamination from the environment and the body.
	<p>Tissue</p> <ul style="list-style-type: none"> Sample is best collected at the initial stage of postmortem. Decontaminate the skin and organs before inserting needles or cutting out the tissue blocks. Place the tissue in a sterile container.
Blood cultures OR Bone marrow aspirate	<p>Skin decontamination with 70% alcohol followed by povidone iodine or chlorhexidine</p> <p>An automated blood culture system with different types of bottles according to age are used:</p> <ul style="list-style-type: none"> Adults: Aerobic and anaerobic culture bottle. Volume: 8 – 10 mls each bottle. Pediatric: A single pediatric blood culture bottle. Volume: 0.5 – 5 mls. Fungal C&S: Mycobacteria/Yeast/Fungi blood culture bottle Volume: 3-5 mls. TB Blood Culture: Mycobacteria/Yeast/Fungi blood culture bottle. Volume: 3-5 mls. <p>Note: Do not store the specimens in the refrigerator.</p>
Cerebrospinal Fluid (CSF)	<ul style="list-style-type: none"> Collect 3 – 4 ml of CSF in sterile Bijou bottles for the examination of microscopy and cultures. Send the specimen immediately to the laboratory <p>Note: Do not store the specimen in the refrigerator.</p>
Clostridium difficile culture and toxin detection	<ul style="list-style-type: none"> Collect fresh stool in a sterile container. Specimens collected in formalin or swabs are not accepted. Transport to the laboratory immediately.

<p>Genital samples</p>	<p>High vaginal swabs</p> <ul style="list-style-type: none"> • This is suitable for the diagnosis of candidiasis and other causes of vaginitis but NOT gonorrhoea in female patients. • Using a sterile speculum lubricated with sterile normal saline and not antiseptic cream, swab either from the posterior fornix or the lateral wall of the vagina. • Inoculate the swab into Amies transport medium and send the specimen to the laboratory immediately. <hr/> <p>Endocervical swab</p> <ul style="list-style-type: none"> • This is the best specimen for the diagnosis of gonorrhoea and puerperal sepsis. • Under direct vision, gently compress the cervix with blades of speculum. Use a rotating motion with a swab to obtain exudates from the endocervical canal. • Inoculate the swab into the Amies transport medium. <hr/> <p>Urethral discharge (Male)</p> <ul style="list-style-type: none"> • Wipe the urethra with a sterile gauze or swab. • Collect the exudates with a sterile swab and inoculate it into the Amies transport medium. • If discharge cannot be obtained by 'milking' the urethra, use a sterile swab to collect material from about 2 cm inside the urethra. • Place the swab into the Amies transport medium.
<p>Pus/ Swabs/ Tissue</p>	<ul style="list-style-type: none"> • Pus: <ul style="list-style-type: none"> -Send in a sterile container. -Pus from undrained subcutaneous abscesses or sinus tracts should be collected with a sterile needle and syringe -If grains are visible in the pus (as in mycetoma), these must be collected. In mycetoma, if the crusts at the opening of the sinus tracts are lifted, grains can often be found in the pus underneath • Tissue: <ul style="list-style-type: none"> -Send all tissues for culture in a sterile container. Do not add formalin to the specimen -If possible, material should be obtained from both the middle and edge of the lesions -Small cutaneous, subcutaneous or mucosal lesions can often be excised completely • Swab is an inferior substitute and should be sent in an Amies transport medium.

<p>Respiratory specimens</p>	<p>Nasal swab</p> <ul style="list-style-type: none"> • Commonly done for screening of MRSA carriage. • Moisten a swab with sterile saline. • Swab both the anterior nares and insert the swab into the nose and gently rotate against the nasal mucosa. • Place the swab in Amies transport medium immediately.
	<p>Throat swab</p> <ul style="list-style-type: none"> • Throat swabs are obtained to recover Group A (<i>Streptococcus pyogenes</i>), C, G Streptococcus, <i>Corynebacterium diphtheriae</i>, <i>Arcanobacterium haemolyticum</i> and <i>Neisseria gonorrhoea</i>. • Request patients to open their mouths widely. Gently depress the tongue with a tongue depressor and rub the sterile swab over the tonsillar areas and the mucosa on the posterior pharyngeal wall behind the uvula. • Gently turn the swab so that its whole surface comes in contact with the inflamed mucosa or lesion • Avoid touching the oral mucosa or tongue with the swab. • Place the swab in Amies transport medium immediately.
	<p>Swab from mouth, gums and oral cavity</p> <ul style="list-style-type: none"> • Rinse mouth with water before sampling. • Using a sterile swab, rub into areas of exudation or inflammation and place it into Amies transport medium .
	<p>Sputum</p> <ul style="list-style-type: none"> • Collect the sputum early in the morning, after a deep cough or after a session of physiotherapy. If tuberculosis is suspected, send 3 consecutive specimens (1 specimen per day). • Request the patient to cough deeply and spit directly into a sterile container. • The material expectorated should be secretions from the bronchi and not saliva from the mouth.
	<p>Bronchial alveolar lavage (BAL) / brushings / biopsies</p> <ul style="list-style-type: none"> • Place the specimen which is obtained via bronchoscopy into a sterile container. • Send the specimen to the laboratory immediately.
<p>Stool</p>	<ul style="list-style-type: none"> • Collect faeces into a sterile / clean wide-mouth screw-capped plastic container. • If the faeces is liquid, the container may be filled to one-third full (excessive amount will result in spillage when opened) • Enrichment medium i.e., Alkaline peptone for <i>Vibriosis</i> and Selenite F for <i>Salmonella</i> can be obtained from the laboratory for bedside inoculation <p>Note: -Rectal swab is a poor second-best alternative to faeces. If it is not possible to obtain faeces, collect a specimen by inserting a cotton swab into the rectum and place in a cary blair transport medium.</p>

	-For stool clearance culture in cases of typhoid, stool should only be sent upon <i>completion</i> of therapy
Urine	Midstream urine
	Male patients <ul style="list-style-type: none"> • Withdraw the prepuce and cleanse the glans penis with soapy water and thoroughly rinse with water • Pass the first few millimeters of urine to flush out the bacteria from the urethra, • Collect the mid-stream portion in a sterile universal container and close it tightly
	Female patients <ul style="list-style-type: none"> • Clean the peri-urethral area and perineum with soapy water and thoroughly rinse with water. • Hold the labia apart during voiding and pass the first few millimeters of urine. • Collect the midstream portion in a sterile container and close it tightly
	Catheterized urine <ul style="list-style-type: none"> • Catheter urine specimens should be taken by aseptic puncture of the catheter conduit and syringe out into a sterile container • Urine from catheter bags is generally unsuitable for culture
	Bladder urine <ul style="list-style-type: none"> • This is obtained via suprapubic aspiration or cystoscopically • Urine is collected in a sterile container
Skin, nails and hair	General Note: <ul style="list-style-type: none"> • Clean cutaneous and scalp lesions with 70% alcohol prior to sampling as this will improve the chances of detecting fungus on microscopic examination, as well as reducing the likelihood of bacterial contamination of cultures. Prior cleaning is essential if ointments, creams or powders have been applied to the lesion • Skin, nails and hair specimens should be collected into folded squares of paper or directly onto an agar plate
	Skin <ul style="list-style-type: none"> • Material should be collected from cutaneous lesions by scraping outwards from the margin of the lesion with the edge of a glass microscope slide or a blunt scalpel
	Hair <ul style="list-style-type: none"> • Specimens from the scalp should include hair roots, the contents of plugged follicles and skin scales. • Hairs should be plucked from the scalp with forceps or the scalp is brushed with a plastic hairbrush and collected onto an agar plate
	Nail <ul style="list-style-type: none"> • Nail specimens should be taken from any discolored, dystrophic or brittle parts of the nail • Specimen should be cut as far back as possible from the edge of the nail and should include the full thickness of the nail

Ear	Scrapings of material from the ear canal are to be preferred, although swabs can also be used
Ocular specimens	<ul style="list-style-type: none"> Material from patients with suspected fungal infection of the cornea (keratomycosis) should be collected by scraping the ulcer. The entire base of the ulcer, as well as the edges, should be scrapped. (Swabs are not suitable for sampling corneal lesions) The material is collected directly onto agar plates for culture and to a glass slide for microscopic examination

MOLECULAR TESTS	
Blood	<ul style="list-style-type: none"> Collect 3 – 5 ml of blood into EDTA tube Sent directly to laboratory within 4 hours after being taken
CSF	<ul style="list-style-type: none"> Collect minimum of 0.5 ml of CSF into a sterile Bijou bottle Sent directly to laboratory as soon as possible after lumbar puncture
Tissue Biopsy	<ul style="list-style-type: none"> If possible, sample should consist of both the middle and the edge section of the tissue Small sample of minimum roughly 0.3 cm size is appropriate method Place tissue in an empty sterile container and do not add formalin into the specimen Sent directly to laboratory within 2 hours after being taken
Ocular specimens	<ul style="list-style-type: none"> Specimens from patients with suspected infection of cornea (ocular fluids) should be collected properly. Take a minimum of 0.3 ml of sample Place specimen into an empty sterile Bijou bottle Sent directly to Microb lab within 2 hours after collection
Vesicles fluids (Larger amount)	<ul style="list-style-type: none"> Collect a minimum of 0.3 ml of sample using a sterile needle by puncturing the lesion Place specimen into an empty sterile Bijou bottle Sent directly to Microb lab in ice within 2 hours after collection.
Vesicle fluids (Smaller amount)/ lesion fluids (i.e: Monkey pox lesion)	<ul style="list-style-type: none"> Hold the swab with a firm grasp. Avoid touching the length of the swab shaft that will be submerged in liquid (VTM). Apply firm pressure (generally firm enough so that the swab shaft, if plastic, may bend slightly). This may result in discomfort or slight pain, but it is necessary to obtain adequate DNA. <ol style="list-style-type: none"> If lesion ruptures while swabbing, ensure that swab collects lesion fluid. If possible, avoid using swabs that bend too easily which may make applying firm pressure difficult. Swipe the swab back and forth on the lesion surface at least 2 to 3 times then rotate and repeat on the other side of the swab at least 2 to 3 times. If material is visible on the swab surface (such as skin material or from lesion fluid that is leaking from the lesion), this is indicative of an adequate collection. Although please note that material may not always be visible on swabs. Place the entire swab in sterile container or container with viral transport media container <p>Please refer to GUIDELINES MPOX MANAGEMENT IN MALAYSIA</p>

Bone Marrow	<ul style="list-style-type: none"> ● Collect a minimum of 0.3 ml of the aspirated sample ● Place specimen into an empty sterile Bijou bottle ● Send directly to laboratory within 2 hours after collection
Respiratory specimen	<ul style="list-style-type: none"> ● Nasopharyngeal / Oropharyngeal swab to be sent in Viral Transport Medium (VTM) using an ice box and sent to the laboratory immediately. ● Sputum / Tracheal aspirate needs to be sent in a sterile container, packed with an ice box and sent to the laboratory immediately. ● Must ensure the temperature is maintained between 2 – 8°C throughout transport ● Use triple layer packaging for samples tested for COVID-19, MERS-CoV and Monkeypox
Nasopharyngeal aspirate (NPA)	<ul style="list-style-type: none"> ● Patient must sit comfortably, and the head tilted slightly backward. Instill 1 – 1.5 ml of sterile, physiological saline (pH7.0) into one nostril ● Flush 3 cc syringe with 2 – 3 ml of saline. Insert the syringe into the nostril parallel to the palate. Flush in and out few times ● Aspirate nasopharyngeal secretions and collect specimens in sterile containers. Transport on wet ice.
Nasopharyngeal swab	<ul style="list-style-type: none"> ● Insert a flexible, fine shafted polyester swab into the nostril and back to the nasopharynx ● The swab should be slid straight into the nostril with the patient's head held slightly back ● The swab is inserted following the base of the nostril towards the auditory pit and will need to be inserted at least 5 – 6 cm in adults to ensure that it reaches the posterior pharynx ● Leave the swab in place for a few seconds. Withdraw slowly with a rotation. ● Put the tip of the swab into a vial containing VTM and breaking applicator' stick. Close the vial and seal <p>Refer to the picture diagram below for the instructions.</p>

INSTRUCTIONS FOR NASOPHARYNGEAL SAMPLE COLLECTION

USING FLOCKED MINI-TIP SWAB AND UTM™ UNIVERSAL TRANSPORT MEDIA

COLLECTION SUPPLIES

- Swab (1)
- Tube of medium (1)



This guide is for Illustration Purposes Only. Always read the manufacturer's package insert for specific instructions regarding specimen collection and transport for the type of test kit being used.

COLLECT THE SAMPLE



Wash hands with soap and water and don personal protective equipment.



1 Remove the swab from its packaging, holding by the end of the applicator and identify the breaking point.



2 Position head slightly back.



3 Gently insert the swab into the nostril. Keep the swab near the septum floor of the nose while gently pushing the swab into the post nasopharynx.



4 When the swab is in place, rotate in a circular motion gently against the nasopharyngeal mucosa for 10 – 15 seconds then gently remove swab.

▪ As a visual reference, the swab should be inserted about half the distance from the opening of the patient's nostril and the ear.

PACKAGE THE SAMPLE



5 While holding the swab, remove the cap from the tube.

- Insert the swab into the tube until the breakpoint is level with the tube opening.
- Bend the swab shaft at a 180 degrees angle to break it off at the breaking point. You may need to gently rotate the swab shaft to complete the breakage.



6 Discard the broken part of the applicator into an approved waste disposal container.



7 Screw the cap back onto the tube and apply patient identification label or write patient information on the tube label.



Wash hands with soap and water.

Critical Result Notification Policy

1. Only **first time** critical value will be notified
2. The **authorized recipients** shall only be:
 - a. Doctor
 - b. Medical Assistant
 - c. Nurse
3. Results shall be reported according to the **location specified** on the form/ request. It is the responsibility of the requester to inform the subsequent ward where the patient was transferred
4. If location is not specified, result shall not be informed
5. The **first person** who receives the notification shall accept and take the call even though the patient is not under his/her care. The same applies in the event the patient has transferred to another location.
6. If the first call is engaged or left unanswered, lab shall make a second after 5 to 10 minutes. Only **2 call attempts** shall be made for each notification.

LIST OF FACTORS AFFECTING TESTS RESULTS IN MICROBIOLOGY

FACTORS	IMPACT	PRECAUTIONS
Type of sample collected	Wrong or suboptimal specimen may not contain the pathogen	Choose the correct specimen type based on the suspected infection (e.g., sputum for pneumonia, CSF for meningitis, etc)
Method of specimen collection	Poor technique can cause contamination or insufficient sample	Use sterile container, proper site preparation with aseptic and correct technique. (e.g., sputum for AFB need to collect at early morning & deep cough sample)
Timing of collection	Delayed or untimely sampling (e.g., after antibiotics) may give false negatives	Collect specimens before antibiotic therapy and at the appropriate stage of illness
Volume of specimen	Too little sample may not yield growth, especially in blood cultures	Follow recommended volumes (e.g., ≥10mL for adult blood cultures)
Sample contamination	May result in false positives or mixed flora (e.g., skin flora in blood cultures)	Proper skin disinfection and aseptic technique during collection. Wound swab sample collected from the depth of the wound, not the surface.
Transportation delay	Overgrowth of contaminants or death of pathogens	Transport specimens promptly and follow time limits
Temperature during transport/storage	Incorrect temperature can kill or alter organisms (e.g., Neisseria spp.)	Use appropriate storage (e.g, CSF at room temperature, urine at 4°C if delayed)
Use of incorrect or no transport media	Fastidious organisms may not survive transit	Use recommended transport media (e.g., Amies charcoal for swabs)
Inappropriate labelling and documentation	Misidentification or specimen rejection	Label with patient identification, date/time, specimen type and clinical details
Interference by antibiotics or antiseptics	May suppress or kill target organisms	Avoid contamination from topical agents; collect before therapy when possible
Delay in processing at laboratory	Affects viability and detection of organisms	Prioritize urgent specimens; maintain sample in appropriate condition until processed
Patient factors	Immunosuppressed patients may show atypical results or low pathogen load	Provide relevant clinical information to laboratory (in the request form) to assist with interpretation

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
1	Air sampling	Agar plate from dedicated places	Agar plates (BA and NA and/or SDA)	N/A	3 days	This test done under UKI (<i>Unit kawalan infeksi</i>)
2	ATTEST (Biological Indicator sterilization test)	Biological indicator tube	N/A	N/A	2 days	1) Test for sterilizer performance. 2) The sterilized biological indicator tube to be tested MUST be sent with another non-sterilized tube as positive control.
3	Blood culture & sensitivity (Bacteria)	Blood or Bone marrow	Blood culture bottle (aerobic/anaerobic/ paediatric)	Adult :8-10 ml, Paed: 1-5ml	Negative culture: 5 days Positive culture: 3-5 days	1) Blood samples from both peripheral and central catheter for CRBSI must be collected simultaneously. 2) DO NOT REFRIGERATE
4	Bone culture & sensitivity	Bone	Sterile container (WITHOUT any preservative)	Size: 0.5-1 cm ³ Weight: 0.1-0.5 grams	Negative culture: 2 days Positive culture: 3-5 days	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
5	<i>Bordetella pertussis</i> culture & sensitivity	Pernasal swab/Nasopharyngeal swab Nasopharyngeal aspirate	Swab in Amies with charcoal transport medium Sterile container	N/A 3-5 ml	Negative culture: 7 days Positive culture: 3-5 days	Please state the test name on request form.
6	Central venous catheter (CVC) tip culture & sensitivity (i.e PICC, Chemoport, CVL- IJC or femoral etc)	CVC Tip	Sterile container	5 cm	3-5 days	
7	Cerebrospinal fluid (CSF) culture & sensitivity	CSF	Sterile bijoux bottle	1-3 ml	Negative culture: 2 days Positive culture: 3-5 days	DO NOT REFRIGERATE
8	Cerebrospinal fluid (CSF) microscopic – FEME/cell count, india ink	CSF	Sterile bijoux bottle	1-3 ml	1 Hour	DO NOT REFRIGERATE

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
9	Clostridium difficile-Antigen and Toxin A&B	Watery or soft faecal samples (preferably contain blood or mucus)	Sterile container	About 5 ml	1 day	Hard/solid stools will be rejected.
10	Eye specimen for microscopy	Corneal scrapings Conjunctiva scrapings	Smear on 2 separate slide	N/A	1 day	Please collect slide & slide mailer from the microb lab
11	Eye specimen culture & sensitivity	Corneal scrapings Conjunctiva scrapings Vitreous tapping/fluid Aqueous tapping/ fluid	Direct plating onto: Blood agar, Chocolate agar & Sabouraud agar	Z streaking on agar plate	3-5 days	Please collect agar plates from microbiology lab on the day of procedure
12	Eye or ear swab culture & sensitivity	Conjunctiva Discharge from eye/ear	Swab in Amies with charcoal transport medium	N/A	3-5 days	N/A
13	Eye specimen culture & sensitivity	Vitreous tapping/fluid Aqueous tapping/ fluid	Sterile container	As collected	3-5 days	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
14	Genital specimen Microscopy and culture & sensitivity	Vaginal swab (Low or High vaginal swab)	Swab in Amies with charcoal transport medium	N/A	3-5 days	N/A
15	<i>Neisseria gonorrhoeae</i> culture & sensitivity	Endocervical swab/High vaginal swab	Direct plating on Thayer-Martin media/GC agar/ Chocolate agar	Z streaking on agar plate	3-5 days	Please state on the request form 'for <i>Neisseria gonorrhoeae</i> culture & sensitivity' and type of specimen
		Genital discharge/ Urethral discharge Eye swab Throat swab	Swab in Amies with charcoal transport medium	N/A		
16	Pus culture & sensitivity	Pus Swab	Swab in Amies with charcoal transport medium	N/A	3-5 days	Please state the site of sampling on request from
		Pus Aspirate	Sterile container	N/A		Pus aspirate preferable than swab.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
17	Rectal swab for CRE or VRE surveillance	Rectal Swab	Swab in Cary Blair/Amies with charcoal transport medium	N/A	3-5 days	1) Please state on the request form 'Rectal swab for CRE or VRE surveillance/screening'
18	Respiratory tract specimen culture & sensitivity	BBA/BAL/Bronchial washing/Sputum/ Nasopharygeal aspirate/Tracheal aspirate/ lung aspirate	Sterile container	>1ml	3-5 days	1) Gastric lavage is not a respiratory sample. The sample will be rejected.
19	Sterile body fluid culture & sensitivity	Peritoneal/ Pleural/ Synovial/ Pericardial/CAPD/ Liver aspirate/amniotic fluid/Other body fluids/aspirates collected aseptically	Sterile container	>2 ml	Negative culture: 2 days Positive culture: 3-5 days	Please state on request form the type of specimen
20	Sterility Testing culture & sensitivity	TPN Expressed breast milk/ formula milk Operator sampling (from Pharmacy)	Sterile container	5-10 ml	7 days 2-3 days 14 days	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
21	Swab for MRSA surveillance	Nasal/ Axillary/Groin	Swab in Amies with charcoal transport medium	N/A	1-3 days	Please state on the request form 'For MRSA surveillance/screening' and type of specimen
22	Corynebacterium diptheriae culture & sensitivity	Nasopharyngeal swab/ throat swab or Nasopharyngeal aspirate	Swab in Amies with charcoal transport medium Sterile container	N/A 1-3 ml	3-5 days	Please state on the request form 'For C.diptheriae culture & sensitivity ' and type of specimen
23	Stool Rotavirus Antigen	Fresh stool	Sterile container	About 1g	1 day	Patient ≤ 5 years. Hard/solid stools will be rejected.
24	Stool culture & sensitivity	Fresh stool Rectal swab	Sterile container Swab in Cary Blair transport medium	About 5-10g N/A	3-5 days	Hard/solid stools will be rejected.
25	Tissue culture & sensitivity	Tissue biopsy	Sterile container	5-10mm ³	Negative culture: 2 days Positive culture: 3-5 days	Don't send a slough. Slough sample will be rejected.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF BACTERIOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
26	Urine culture & sensitivity	MSU, Catheterized urine, Suprapubic collection, Nephrostomy fluid (PCN)	Sterile container (yellow cap)	5-10 ml	3-5 days	Please indicate time of collection. Send less than 4 hours to lab.
			Boric acid bottle	20-25 ml		Please fill urine up to line indicated. Send less than 24 hours to lab.
27	Bacterial identification	Pure isolate on specified culture media	N/A	1 plate (BA/MAC) for 1 bacterial isolate	1-3 days	Consult microbiologist upon request
28	Fungal identification	Pure isolate on specified culture media	N/A	1 plate (SDA) for 1 fungal isolate		Please provide preliminary identification and relevant information regarding isolate on the request form
29	Antimicrobial/ Antifungal sensitivity testing	Pure isolate on specified culture media	N/A	1 plate (BA/SDA) for 1 isolate		

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MYCOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
30	Fungal culture & sensitivity	Blood or Bone marrow	Myco/F lytic culture bottle	3-5 ml	Negative culture: 30 days	Please collect the bottle from the Microb lab before procedure
		Epilated Hair	Sterile container or Sterile petri dish	>5 strands of affected hair		N/A
		Nail/Skin scrapings	Sterile container or Sterile petri dish	As much as possible		N/A
		Tissue biopsy/ Pus	Sterile container (Without preservative)	5-10 mm ³		N/A
		Sterile fluid	Sterile container	5-10 ml	Negative culture: 14 days	N/A
		MSU, catheterized urine, suprapubic collection , nephrostomy fluid(PCN)	Sterile container (yellow cap)	5-10 ml		Please indicate time of collection. Send less than 4 hours to lab.
			Boric acid bottle	20-25 ml		Send less than 24 hours to lab.
		Respiratory sample (sputum, bronchial washing or Bronchioalveolar lavage (BAL))	Sterile container	>1ml		N/A
		Corneal/conjunctiva scrapping	Streak on plate media	N/A		Please collect agar plates from microbiology lab on the day of procedure
		Vitreous fluid	Sterile container or bijou bottle	~1-2 ml		

THE LIST OF MYCOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
31	<i>Cryptococcal</i> Antigen	CSF	Sterile bijoux bottle	1 ml	2 hours	N/A
		Serum	Plain tube	3 – 5ml	2 hours	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise



THE LIST OF PARASITOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
32	Blood film for Malarial parasite (BFMP)	Slide (include thick and thin smear)	Glass slide with slide mailer	(thick & thin smear)	2 hours upon sample received	Ensure good smear was done & slide smear MUST dry before sending and packed in the slide mailer.
		Blood	EDTA tube	3-5 ml	4 hours upon sample received	Blood sample must be send immediately to the Microb lab within 2 hours from collection time.
33	Blood film for microfilariae	Blood	EDTA	3-5 ml	24 hours	Preferably midnight sample (8 pm-12 am)
34	Microscopy: Ova & Cyst or helminth	Semi solid or liquid stool	Sterile container	>5 g for semi solid stool, >5 ml for liquid stool	1 day	Hard/solid stools will be rejected.
35	<i>Trichomonas vaginalis</i> wet mount	Vaginal discharge/Urethral discharge/Penile discharge/Urethral mucosa scrapping	Specimen send in sterile container with 1 ml normal saline	N/A	1 day	1) Send to the lab within 2 hours of collection. 2) Dry sample and received more than 2 hours will be rejected
			Swab in Amies with charcoal transport medium	N/A	1 day	Swab in Amies transport medium must be send less than 24 hours.

THE LIST OF SEROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
36	<i>Legionella pneumophila</i> Antigen	Fresh urine	Sterile urine container	5 ml	1-3 working days	First void preferred
37	Leptospira Antibody IgM	Serum	Plain Tube	3-5 ml	1 working day	1) <u>Request form:</u> PERPAT 301 request form is attach together with Leptospirosis request form (MKAJB) (DWS/01-016) 2) Sample with positive/ equivocal result will be sent to MKAJB for Leptospira MAT.
38	<i>Mycoplasma pneumoniae</i> Antibodies	Serum	Plain Tube	3-5 ml	1-3 working days	LTAT is not applicable for samples requiring further testing (absorption test)
39	<i>Pneumocystis jirovecii</i> pneumonia Serology - IF (immunofluorescence)	Induced Sputum/sputum/BAL/ Bronchial Wash	Sterile container	2-5 ml	5 working days	Previously known as <i>Pneumocystis carinii</i> . Sample other than listed will be rejected.
40	Rapid plasma reagin (RPR) test	Serum	Plain Tube	3-5 ml	1-3 working days	N/A

THE LIST OF SEROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
41	<i>Treponema pallidum</i> Particle Agglutination (TPPA)	Serum	Plain Tube	3-5 ml	3-5 working days	A reflex test for RPR reactive sample or special request for high risk patient
42	Dengue Rapid IgG, IgM & NS 1 Ag	Serum	Plain Tube	3-5 ml	1 hour	N/A
43	Dengue Serology IgG/ IgM (ELISA)	Serum	Plain Tube	3-5 ml	1-3 working days	N/A
44	Toxoplasma IgG & IgM	Serum	Plain Tube	3-5 ml	3 working days	For paediatric <1year old: only IgM is indicated
45	Anti Streptolysin-O Titer (ASOT)	Serum	Plain Tube	3-5 ml	1-3 working days	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF IMMUNOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
46	Anti Nuclear Antibody (ANA)	Serum	Plain Tube	3-5 ml	10-14 working days	N/A
47	Anti-Neutrophil Cytoplasmic Antibody (ANCA)	Serum	Plain Tube	3-5 ml	10-14 working days	The request form must countersign with specialist's signature.
48	Double Stranded DNA (dsDNA) Test	Serum	Plain Tube	3-5 ml	10-14 working days	1) A reflex test for positive ANA homogenous pattern.
49	Extractable Nuclear Ag (ENA)	Serum	Plain Tube	3-5 ml	10-14 working days	2) If special request, only indicated cases will be accepted and the request form must countersign with specialist's signature.
50	Anti Cardiolipin IgG & IgM	Serum	Plain Tube	3-5 ml	10-14 working days	The request form must countersign with specialist's signature.
51	Anti β 2 Glycoprotein IgG & IgM	Serum	Plain Tube	3-5 ml	10-14 working days	
52	Anti Cyclic citrunillated peptide (CCP)	Serum	Plain Tube	3-5 ml	10-14 working days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
53	Anti Tissue Antibodies: Anti Mitochondrial Antibody (AMA), Anti Smooth Muscle Antibody (ASMA), Anti Liver Kidney Microsomal Antibody (LKM), Anti Gastric Parietal Cell Antibody (GPC)	Serum	Plain Tube	3-5 ml	10-14 working days	The request form must countersign with specialist's signature.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF VIROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
54	Hepatitis A virus IgM (HAV IgM)	Serum	Plain Tube	3-5 ml	3-5 working days	N/A
55	Hepatitis B virus surface Antigen (HBs Ag)	Serum	Plain Tube	3-5 ml	1-3 working days	N/A
56	Hepatitis B virus surface Antigen (HBs Ag) Confirmatory	Serum	Plain Tube	3-5 ml	3-5 working days	A reflex test for Hepatitis B virus surface Antigen (HBs Ag) reactive sample.
57	Hepatitis B virus core total antibody (HBc Ab)	Serum	Plain Tube	3-5 ml		
58	Hepatitis B virus core IgM (HBc IgM)	Serum	Plain Tube	3-5 ml		
59	Hepatitis B virus envelope Antigen (HBeAg)	Serum	Plain Tube	3-5 ml		
60	Hepatitis B virus envelope Antibody (HBeAb)	Serum	Plain Tube	3-5 ml		
61	Hepatitis B virus surface Antibody (HBsAb)	Serum	Plain Tube	3-5 ml	1-3 working days	N/A
62	Hepatitis C virus antibody screening (Anti HCV)	Serum	Plain Tube	3-5 ml	1-3 working days	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF VIROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
63	Hepatitis C core antigen (HCVcAg)	Serum	Plain Tube	3-5 ml	3-5 working days	A reflex test for Hepatitis C virus antibody reactive sample.
64	HIV Antigen/Antibody (HIV Ag/Ab) screening	Serum	Plain Tube	3-5 ml	3 working days	To collect result in hardcopy from the serology lab/pigeon hole
65	HIV 1&2 antibody differentiation test	Serum	Plain Tube	3-5 ml	3-5 working days	A reflex test for HIV Ag/Ab Screening reactive sample.
66	Herpes Simplex Virus (HSV) IgG & IgM	Serum	Plain Tube	3-5 ml	5 working days	For paediatric <1year old: only IgM is indicated
67	Mumps IgG/ IgM	Serum	Plain Tube	3-5 ml		
68	Parvovirus IgG/ IgM	Serum	Plain Tube	3-5 ml		
69	Respiratory specimen for viruses detection – Immunofluorescence (IF)	Nasopharyngeal aspirate	Sterile container (Preferred in sterile tube)	3-5 ml	1-3 working days	Please transport sample in ice

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF VIROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
70	Cytomegalovirus (CMV) IgG/IgM	Serum	Plain Tube	3-5 ml	3 working days	For paediatric <1year old: only IgM is indicated
71	Epstein Barr Virus (EBV) IgG/ IgM	Serum	Plain Tube	3-5 ml		
72	Rubella virus IgG/ IgM	Serum	Plain Tube	3-5 ml		
73	Varicella zoster virus (VZV) IgG/ IgM	Serum	Plain Tube	3-5 ml	5 working days	
74	TORCHES screening	Serum	Plain tube	3-5 ml		
75	Organ donation viral screening: (URGENT tests) i. CMV IgG ii. Toxoplasma IgG iii. Hepatitis B (HBsAg & HBcore total Ab) and Hepatitis C (AntiHCV) iv. HIV Ag/Ab v. RPR	Serum	5 Plain tubes	3-5 ml each	4 hours	1) The test is requested by Transplant team. 2) Please consult serology lab (working hours) or on-call microbiologist upon request 3) Other test requests (i.e:HSV/ VZV etc) will be run in the next batch 4) Please provide separate request forms for each tests

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF VIROLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
76	Needle stick injury-viral screening (Patient/Source) i. Hepatitis B (HBs Antigen) & Hepatitis C (AntiHCV) ii. HIV Ag/Ab	Serum	3 Plain tubes	3-5 ml each	24 Hours	1) Please provide separate request form for each tests. 2) Consult Microbiologist On-call upon request
77	Needle stick injury-viral screening (HCW) i. Hepatitis B (HBs Antigen & AntiHBs-(only if never screened before)) & Hepatitis C (AntiHCV) ii. HIV Ag/Ab	Serum	3 Plain tubes	3-5 ml each	24 Hours	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MOLECULAR TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
78	HIV-1 RNA Viral Load/ PCR	Plasma	EDTA	2 EDTA tubes (5ml blood each) or 3-5 ml plasma	2-4 weeks	1) Haemolysed sample or insufficient sample will be rejected. 2) The request form MUST have specialist's signature and stamp.
79	HIV-1 confirmatory PCR	Plasma	EDTA			
80	Hepatitis B Virus (HBV) DNA viral load	Plasma	EDTA			
81	Hepatitis C Virus (HCV) RNA viral load	Plasma	EDTA			
82	Cytomegalovirus (CMV) DNA PCR/Viral load	Plasma	EDTA		3-5 working days	
83	Epstein-Barr virus (EBV) DNA PCR	Plasma	EDTA			
84	BK virus (BKV) DNA PCR	Plasma	EDTA			

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MOLECULAR TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
85	ZIKA Virus PCR	Blood	Plain tube	3-5 ml	1-3 Working days	1) Blood sample MUST sent together with urine sample. 2) For other samples : please CONSULT the microbiologist 3) The request form MUST have specialist signature and stamp .
		Urine	Sterile container	5-10 ml		
86	MERSCoV PCR	Sputum or lower respiratory tract sample (preferred)	Sterile container	2-3 ml	1-2 days	1) Please consult on-call microbiologist upon request 2) The request form MUST have specialist signature and stamp .
		Combined Nasopharyngeal & Oropharyngeal swab	Dacron Swab in VTM	N/A		

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MOLECULAR TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
87	Mycobacterium tuberculosis rapid molecular- (MTB-ultraRIF GeneXpert)	Respiratory specimen (sputum, BBA, Tracheal aspirate, Bronchial washing, BAL, pleural fluid)	Sterile container	2-3 ml	1-3 working days	<p>1) Requests must be authorised by Medical physician/Chest Specialist /Consultant. The request form MUST have the specialist's signature and stamp.</p> <p>2) For other than respiratory specimen, please CONSULT the microbiologist.</p>
88	Sexually-Transmitted Diseases (STD) PCR Panel - (<i>Chlamydia trachomatis</i> , <i>Neisseria gonorrhoeae</i> , <i>Mycoplasma genitalium</i> , <i>Ureaplasma urealyticum</i> , <i>Ureaplasma parvum</i> , <i>Mycoplasma hominis</i>)	First-catch urine	Sterile container without preservatives ≥ 20ml	≥ 20ml	14 working days	<p>1) Requests must be authorised by Dermatologist/Physician/ FMS in-charge. The request form MUST have the specialist's signature and stamp.</p> <p>2) Prior to urine sampling, patients should not urinate for at least 1 hour and should not clean the genital area.</p>

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MOLECULAR TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
89	Rapid Respiratory Panel PCR (QIAstat): (Adenovirus, Bocavirus, Coronavirus 229E, coronavirus HKU1, coronavirus NL63, coronavirus OC43, Human metapneumovirus A+B, Influenza A (subtypes : H1, H1N1 pdm 09, H3), Influenza B, Parainfluenza virus 1,2,3,4, RSV A+B, Rhinovirus/Enterovirus, SARS-CoV-2, Bordetella pertussis, Legionella pneumophila, Mycoplasma pneumoniae, Chlamydia pneumophila)	Nasopharyngeal swab	Dacron Swab in UTM	2-3 ml	1-2 days	<ol style="list-style-type: none"> 1) CONSULT on-call microbiologist upon request. 2) For other sample types please consult on-call microbiologist. 3) The request form MUST have specialist's signature and stamp. 4) Sample transported/ packed in ice (2-8°C).
90	SARS-CoV-2 PCR	Upper respiratory tract (Combined Oropharyngeal swab and Nasopharyngeal swab). Lower respiratory tract(Sputum, tracheal aspirate, BAL)	Dacron Swab in VTM Sterile container	N/A	1-2 days	<ol style="list-style-type: none"> 1) The request form MUST have specialist's signature and stamp. 2) Sample transported/ packed in ice (2-8°C).

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MOLECULAR TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
91	Meningoencephalitis Panel PCR (QIAstat) <i>(Enterovirus, HSV 1&2, HHV 6, Human Parechovirus, VZV, E. coli K1, H. influenzae, L. monocytogenes, N. meningitidis, S. agalactiae, Mycoplasma pneumoniae, S. pyogenes, S.pneumoniae, Cryptococcus neoformans/gatii)</i>	CSF	Sterile Bijou	0.5-2 ml	1-2 days	1) CONSULT on-call microbiologist upon request (for sample transportation) 2) Case MUST discussed with Infectious disease specialist/ paediatrician/ neuromedical specialist prior to request. 3) The request form MUST have the specialist's signature and stamp .
92	Influenza PCR	Nasopharyngeal swab/ Throat swab/ Nasal Swab Nasopharyngeal aspirate/BBA/ Bronchioalveolar lavage	Dacron Swab in VTM Sterile container	N/A	1- 3 working days	1) CONSULT on-call microbiologist upon request. 2) The request form MUST have specialist's signature and stamp . 3) Sample transported/ packed in ice (2-8°C).

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MYCOBACTERIOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
93	Acid Fast Bacilli (AFB) Direct smear	Respiratory specimen (sputum, Tracheal aspirate, Bronchial washing, BAL)	Sterile container	3-5 ml	24 hours	1) Preferably early morning sputum. 2) Salivary sample will be rejected except cases from Chest clinic & TB ward.
		Gastric lavage/ Pus/Body fluid/ Urine	Sterile container	3-5 ml	24 hours	N/A
		Swab	Amies Charcoal transport medium	N/A	24 hours	N/A
		CSF	Sterile Bijou bottle	~ 1.0 ml	24 hours	N/A

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

THE LIST OF MYCOBACTERIOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
94	Mycobacteria culture & sensitivity	Respiratory specimen (sputum, Tracheal aspirate, Bronchial washing, BAL)/ Gastric lavage/ Body fluid	Sterile container	2-5ml	Liquid media culture (MGIT): 42 days (for no growth) Solid media (LJ): 8 weeks (for no growth)	Growth culture will be sent to MKAK for Identification and antibiotic sensitivity.
		Urine/Pus/Tissue/ Bone	Sterile container	3-10 ml		
		Swab	Swab in Amies with charcoal transport medium	N/A		
		CSF	Sterile Bijou Bottle	Preferable ~ 1 ml		
		Blood/Bone marrow	Myco F lytic bottle	Adult : 5-10 ml Pediatric : 3-5 ml		
95	<i>Mycobacterium leprae</i> (Leprosy)	Slit Skin Smear (SSS)	Smear from lesions	2 slides - air-dried fixed smear. NEVER heat fixed.	7 working days	Smear done by skin clinic.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

IMPORTANT NOTES!

1. The **referral laboratory turnaround time (RLTAT)**: refers to the turnaround time claimed by the referral laboratory. This does not include specimen handling, transportation and the time taken for the reports to be received by the respective laboratories in the Microbiology unit HSAJB.
2. Every test request to referred lab must include **2 copies of test request forms** unless specified otherwise.
3. **Specialist's signature and stamp** is compulsory.
4. Use **PERPAT-301 request form unless specified otherwise**. Shall use the **latest version** of specified request form from the referral lab website/handbook.
5. Day of Despatch : Monday and Wednesday unless specified otherwise.
6. If required test(s) are not listed in the table below, please contact relevant lab.

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
1	Bartonella serology	Blood	Plain tube	3-5 ml	Hospital Sungai Buloh	2 -3 days	PERPAT 301 Forms (4 copies)
2	Borrelia burgdorferi IgM, IgG	Blood	Plain tube	3-5 ml	Hospital Sungai Buloh	2-3 days	PERPAT 301 Forms (4 copies)
3	Brucella PCR	Whole blood Bacteria colony	EDTA Sealed media plate	5 ml	IMR	10 days	1) Brucellosis Laboratory Request Form (IMR) (IMR/IDRC/BACT/BRUCE/02)
4	Brucella Serology: -ELISA (screening) -Brucellacapt (Confirmation)	Blood	Plain tube	2 ml	IMR	10 days (screening) 5days (confirmation)	2) Transport at room temperature or 2-8 °C if sample is more than 48 hours Must be fresh specimen, taken prior to antibiotic treatment.
5	Brucella Serology (contact case)	Blood	Plain tube	3 ml	MKAK	5 working days	Request form : MKAK-BPU-U01/Rev2018
6	CSF VDRL	CSF	Sterile container or Sterile bijoux bottle	3 ml	Hospital Sultan Ismail (HSIJB)	2-3 working days	PERPAT 301 Forms (2 copies)
7	<i>Aspergillus</i> Galactomannan antigen	Blood/ BAL	Plain tube/ Sterile container	3-5 ml			

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
8	FUNGAL PCR	Fresh clinical specimens : i. Blood ii. Serum iii. Blood in blood culture vial iv. CSF and other sterile body fluids, skin/tissue biopsies v. FFPE can be sectioned and submit in sterile container	i. Blood in EDTA ii. Plain tube iii. Blood culture bottle iv. Tissue and other body fluids in sterile container. v. FFPE ribbon shavings in sterile container	2 ml blood; other samples as much as possible	IMR	14 days	1) Sample from sterile site only . 2) For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval. 3) Transportation at room temperature. If delayed keep at 2-8 °C. 4) Mycology request form (IMR/IDRC/BACT/ MYCO/01)
9	Hypervirulent Klebsiella pneumoniae PCR (hvKp)	Pure bacterial culture	culture media which support the growth	Pure isolate	IMR	7 days	1) Preliminary tests must be performed first and results sent together with pure isolate and clinical history. 2) Transport in room temperature 3) Bacteriology Request Form (IMR) (IMR/BACT/FORMS/SMIS/01)
10	Microscopic Agglutination test (MAT) for Leptospira	Serum	Plain tube	3 ml	MKAJB	7 days	Leptospirosis request form (MKAJB) (D/WS/01-016)

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
11	Leptospira Culture	Whole blood	EDTA tube	5 ml	IMR	21 days	1) Recommended to send another sample for Leptospira PCR for higher sensitivity. 2) Send whole blood at room temperature. DO NOT FREEZE OR CHILL THE SAMPLE. 3) Leptospirosis Laboratory Request Form (IMR/IDRC/BACT/ LEPTO/01)
12	Leptospiral PCR	i. Whole blood ii. Sterile body fluids, CSF, Bronchial lavage (BAL), Tissue biopsies/ postmortem samples and Formalin-Fixed-Paraffin-Embedded (FFPE) iii. Urine*	Blood in EDTA; other samples in sterile container	2-3 ml	IMR	6 days	1) For better sensitivity, blood samplings should be taken during acute febrile stage prior to antibiotic treatment. 2) *Test for urine sample is by consultation ONLY (Please call IMR at 03-33628960) 3) Leptospirosis Laboratory Request Form (IMR/IDRC/BACT/ LEPTO/01)

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
13	Bartonella PCR	Whole blood Tissue (Lymph node)	EDTA Tube Sterile container	2 ml	IMR	5 days	1) By consultation only (Please contact IMR at 03-33628358/ 03-33628935 / 03-33627464) 2) Bartonella request form (IMR) (IMR/BACT/FORMS/BART/01) 3) Transport at room temperature or 2-8 °C if sample is more than 48 hours Must be fresh specimen, taken prior to antibiotic treatment.
14	(1,3)-Beta-D-Glucan Antigen	Blood	Plain tube	3-5 ml	Hospital Sungai Buloh	5 days	PERPAT 301 Forms (4 copies)
15	<i>Vibrio cholerae/ Vibrio spp</i> (Outbreak)	Pure isolate	Nutrient agar slant	N/A	MKAK	30 days (outbreak)	1) By appointment for outbreak cases (for PFGE) 2) Request form:MKAK-BPU-U01/Rev2018
16	<i>Salmonella typhi/Salmonella spp</i> (Outbreak)	Pure isolate	Nutrient agar slant	N/A	MKAK	30 working days (outbreak)	
17	Detection of <i>Burkholderia pseudomallei</i> IgM (Meliodosis)	Serum	Plain tube	2-3 ml	IMR	5 days	1) Bacteriology Request Form (IMR) (IMR/BACT/FORMS/SMIS/01) 2) Transport at room temperature; if delayed keep at 2-8°C

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
18	PFGE (DNA Fingerprinting for nosocomial infection)	Bacterial culture	Nutrient agar slant	Pure isolate	IMR	2 months	<ol style="list-style-type: none"> 1) Request by Consultation, Please contact IMR at 03-33627809 / 03-33627493 / 03-33628354 2) Bacteriology Request Form (IMR/BACT/FORMS/SMIS/01) 3) Transportation sample at room temperature
19	PFGE for Salmonella Typhi	Bacterial culture	Nutrient agar slant	Pure isolate	IMR	2 months	<ol style="list-style-type: none"> 1) Request by Consultation, Please contact IMR at 03-33627809 / 03-33627493 / 03-33628354 2) Bacteriology Request Form (IMR/BACT/FORMS/SMIS/01) 3) Transportation sample at room temperature
20	Rickettsia IIP	Blood	Plain tube	3-5 ml	Hospital Sultan ismail (HSIJB)	2 days	PERPAT Forms (2 copies)
21	Rickettsial PCR (Scrub typhus / murine typhus / tick typhus)	Whole blood / eschar biopsy / eschar swab	Blood in EDTA; tissue (eschar) samples in sterile container or dacron swab in VTM.	5 ml	IMR	5 days	<ol style="list-style-type: none"> 1) Rickettsiosis Laboratory Request Form (IMR) (IMR/BACT/FORMS/RICK/02) 2) Transportation at room temperature, if more than 48 hours transport at 2-8 °C.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
22	Coxiella burnetti serology (IgM, IgG)	Blood	Plain tube	3-5 ml	Hospital Sungai Buloh	2 -3 days	PERPAT 301 Forms (4 copies)
23	<i>Pneumocystis jirovecii</i> Genome Detection (PCR)	Bronchoalveolar lavage (BAL)/ Induced Sputum	Sterile container	5 ml	Hospital Sungai Buloh	2-5 days	PERPAT 301 Forms (4 copies)
24	Malaria PCR	Blood/ BFMP Slide	EDTA/ Slide holder	2.5 ml	MKAJB	7 days	<ol style="list-style-type: none"> 1) All positive BFMP cases (1st sample) will be send to MKAJB 2) Request form: PERPAT 301 Forms 3) For negative BFMP cases, consultation to MKAK is required.
25	Dimethyl sulfoxide (DMSO) stain for <i>Cryptosporidium spp</i> , <i>Cyclospora spp</i> , <i>Isospora spp</i> and Gram Chromotrope (GC) stain for <i>Microsporidium spp</i>	Fresh Stool (without preservatives)	Sterile container	5 g	Institut Kanser Negara (IKN)	3 working days	To send sample within 24-48 hours in room temperature with PER PAT 301 request form

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
26	Amoebiasis Serology	Serum/ Plasma	Plain tube/EDTA	2 ml	IMR	5 days	1) Request form: PERPAT 301 FORM (2 copies) 2) Sample transported in ice
27	Filariasis Serology	Serum/ Plasma	Plain tube/EDTA	2 ml	IMR	1 day	
28	Filariasis PCR	Whole Blood in EDTA/ blood on slides	EDTA tube or slide mailer	2.5 ml	IMR	7 days	1) Blood taken between 6pm-12am 2) Request form: PERPAT 301 FORM (2 copies) 3) Sample transported at room temperature/ in ice
29	Taeniasis / cysticercosis - Serology	Serum/ Plasma	Plain tube/EDTA	2 ml	IMR	5 days	1) Request form: PERPAT 301 FORM (2 copies) 2) Sample transported in ice
30	Toxocariasis Serology	Serum, anti-coagulated blood	Plain tube/EDTA	2 ml	IMR	5 days	
31	Hydatid Disease/Echinococcosis Diagnosis - Serology	Serum/ Plasma	Plain Tube/ EDTA tube	2 ml	IMR	5 days	
32	Leishmaniasis Serology	Serum/ Plasma	Plain/ EDTA tube	2 ml	IMR	5 days	
33	Schistosomiasis Serology	Serum/ Plasma	Plain/ EDTA tube	2 ml	IMR	5 days	
34	Trichinellosis Serology	Serum/ Plasma	Plain/ EDTA tube	2 ml	IMR	5 days	
35	Toxoplasmosis serology (Confirmatory test-IgG avidity test)	Serum/ Plasma	Plain/ EDTA tube	2 ml	IMR	14 days	

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
36	Acanthamoeba spp - PCR	Corneal scraping/ Contact lens/ Contact lens suspension/	Sterile/ air tight/ contact lens storage (Medium in container: sterile distilled water or saline)	2 ml	IMR	7 days	1) Request form: PERPAT 301 FORM (2 copies) 2) Sample transported in ice
37	Acanthamoeba spp /Naegleria sp. microscopy	Cerebrospinal fluid		2 ml	IMR	3 days	1) Request form: PERPAT 301 FORM (2 copies) 2) Sample transported at room temperature
38	Leishmaniasis Microscopy	Whole Blood in EDTA/ Lymph biopsy film/ Bone marrow film	EDTA Tube/ Slide mailer	2.5 ml	IMR	3 days	1) Request form: PERPAT 301 FORM (2 copies) 2) Blood in ice/ Film in room temperature (Before REFERRAL, Initial ID parasite to determine by customer)
39	Trypanosomiasis Microscopy	Whole blood in EDTA/ Thick blood film/ Lymph node film	EDTA tube/ Slide Mailer	2.5 ml	IMR	3 days	1) Blood in ice / Thick and thin film in room temperature(Before REFERRAL, Initial ID parasite to determine by customer) 2) Request form: PERPAT 301 FORM (2 copies)

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
40	Gastrointestinal Protozoa PCR (Multiplex PCR): (<i>Blastocystis hominis</i> , <i>Cryptosporidium spp</i> , <i>Cyclospora cayetanensis</i> , <i>Dientamoeba fragilis</i> , <i>Entamoeba histolytica</i> and <i>Giardia lamblia</i>)	Stool (without preservative) Rectal swab	Sterile container Swab in cary blair transport medium	N/A	Institut Kanser Negara (IKN)	5 working days	1) Transport in 2-8°C (within 2 days) or in -20°C (in 1 month) 2) Request form: PER-PAT 301 form with significant clinical history & specialist signature (2 copies)
41	Gastrointestinal-Helminth PCR (Multiplex PCR): (<i>Ancylostoma spp.</i> , <i>Ascaris spp.</i> , <i>Enterobius vermicularis</i> , <i>Enterocytozoon spp./</i> <i>Encephalitozoon spp.</i> , <i>Hymenolepis spp.</i> , <i>Necator americanus</i> , <i>Strongyloides spp.</i> , <i>Taenia spp.</i> , <i>Trichuris trichiura</i>)	Stool	Sterile container or Cary blair transport medium	N/A	Institut Kanser Negara (IKN)	5 working days	1) Request form: 2 copies of PER-PAT301 form with significant clinical history (i.e: gastroenteritis and/or chronic diarrhea) and specialist's signature. 2) Transport in 2-8°C (within 2 days) or in -20°C (in 1 month)
42	Helminth culture for Hookworm and <i>Strongyloides stercoralis</i>	Stool	Sterile container	N/A	Institut Kanser Negara (IKN)	14 days	1) Request form: 2 copies of PER-PAT301 form with significant clinical history (i.e: gastroenteritis and/or chronic diarrhea) and specialist's signature. 2) Sample must arrive to the IKN within 24 jam and transported in room temperature

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
43	Helminth Macroscopy/ microscopy	Fresh stool/Adult worm/Larvae	Screw lid, air tight container	5.0 g	IMR	5 days	1) Request form: PERPAT 301 FORM (2 copies) 2) 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)
44	Anti-Acetylcholine Receptor Antibody (ACHR)	Blood/ Serum	Plain tube	3-5 ml	IMR	21 days	1) Autoimmune request form (IMR) (IMR/AIRC/Autoimmune/RF) 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
45	Anti-Aquaporin 4 (Anti-Aq4/AQ4)	i)Serum ii)CSF	i)Plain tube ii) Bijou bottle	i) 3-5 ml ii)At least 1 ml	IMR	10 days	
46	Anti - Ganglioside Antibodies (GA)Panel: (Anti-GM1, Anti-GM2, Anti-GM3, Anti-GM4, Anti-GD1a, Anti-GD1b, Anti-GD2, Anti-GD3, Anti-GT 1a, Anti-GT 1b, Anti--GQ1b)	i)Serum ii)CSF	i)Plain tube ii) Bijou bottle	i) 3-5 ml ii)At least 1 ml	IMR	14 days	
47	Anti - Glomerular Basement Membrane (GBM)	Blood/Serum	Plain tube	3-5 ml	IMR	10 days	

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
48	ANTI - INTRINSIC FACTOR	Blood	Plain tube	5 ml	Hospital selayang	30 days	Request form: PERPAT 301 form (2 copies)
49	Anti-N-Methyl-D-Aspartate Receptor (NMDAR) Encephalitis	i)Serum ii) CSF	i. Plain tube ii. Bijou bottle	i) 3-5 ml ii) At least 1 ml	IMR	7 days	1) Autoimmune request form (IMR) (IMR/AIRC/Autoimmune/RF) 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
50	COELIAC ANTIBODIES PANEL: Anti-Endomysium, Anti Gliadin, Anti Tissue Transglutaminase	Blood/Serum	Plain tube	3-5 ml	IMR	21 days	1) Autoimmune request form (IMR) (IMR/AIRC/Autoimmune/RF) 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
51	Panel Cytokines (IL-6): IL-1 beta, IL-6, IL-8 & TNF- alpha	Serum	Plain tube	Blood- 5 mls in plain tube Serum- 2 mls in cryovial tube	IMR	21 days	1) For consultation only , please contact Dr Fatimah: 016-3807873 /03-3362 8879 2) Autoimmune request form (IMR/AIRC/Autoimmune/RF) 3) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
52	Myositis Antibody Panel: (Mi-2 α , Mi-2 β , TIF1 γ , MDA5, NXP2, SAE, Ku, PM-Scl100, PM-Scl75, Jo-1, SRP, PL-12, EJ, OJ and Ro-52)	Serum	Plain tube	5 ml (adult) 1.5-2ml (paeds)	Hospital Selayang	40 Days	1) Case MUST discussed with: Rheumatologist or Neurologist 2) Request form: PERPAT 301 form (2 copies) with clinical indications and specialist's signature.

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
53	HLA Antibody Test (PRA/DSA)	Blood	Plain tube	6 ml	IMR	20 days	<ol style="list-style-type: none"> 1) Appointment is NOT required. For transplant recipient only (screening test) 2) Please fill in all sections in the request form (HLA Antibody request form (PRA/DSA) IMR/AIRC/TI/RF-4 3) Sample transported at room temperature
54	HLA Typing for Disease Association per loci (i.e: B*27, B*15:02, B*57:01, etc)	Blood	2 EDTA tubes	6 ml	IMR	10 days	<ol style="list-style-type: none"> 1) Test by appointment only. Please call HLA unit IMR at 03-33628382/8383 for appointment 2) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date. 3) Please fill in all sections in the request form HLA Typing test request form (Disease association), IMR/AIRC/TI/RF-3 4) Sample transported at room temperature

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
55	HLA Crossmatch: (Complement Dependent Cytotoxicity) or (Flow Cytometry)	Blood	Sodium Heparin (donor), Plain (patient)	8 ml (donor), 6 ml (patient)	IMR	10 days	<ol style="list-style-type: none"> 1) Test by appointment only. Please call HLA unit IMR at 03-33628382/8383 for appointment 2) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date. 3) Fill all section in the request form: AIRC_TI_Appendix 4 - Request Form for HLA Crossmatch Test (Living Donor) 4) Sample transported at room temperature

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
56	<p>HLA typing:</p> <p>1) Class I (Loci A, B and C) - Low/medium resolution (SSO/SSP-PCR)</p> <p>2) Class I and II (Loci A, B and DR) - HSCT: New case/Add donor for existing case</p> <p>3) Class I and II (Loci A, B, C, DR and DQ) - High Resolution: HSCT: Confirmatory Typing (CT)/Cord blood / MSCR search</p> <p>4) Class I and II (Loci A, B, C, DR and DQ): Solid Organ :New Case/Add donor for existing case;HSCT: Confirmation (Low Resolution)</p> <p>5) Class II(Loci DR,DQ) - Low/medium resolution (SSO/SSP-PCR)</p>	Blood	EDTA	6 ml	IMR	10 days	<p>1) Test by appointment only. Please call HLA unit IMR at 03-33628382/8383 for appointment</p> <p>2) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date.</p> <p>3) Please fill in all sections in the request form: AIRC_TI_Appendix 2 - Request Form for HLA Typing Test</p> <p>4) Sample transported at room temperature</p>

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
57	Paraneoplastic Neurological Syndrome (PNS) Panel: (Anti-Tr (DNER), Anti-GAD65, Anti-Zic4, Anti-Titin, Anti-SOX1, AntiRecoverin, Anti-Amphiphysin, Anti-Ma2/Ta, Anti-Yo, Anti-Ri, Anti-Hu, Anti-CV2)	i) Blood/Serum ii) CSF	i) Plain tube ii) Bijou bottle	i) 3-5 ml ii) At least 1 ml	IMR	14 days	1) Autoimmune request form (IMR) (IMR/AIRC/Autoimmune/RF) 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
58	PHOSPHOLIPASE A2 RECEPTOR Antibody (PLA2R)	Blood/serum	Plain tube	3-5 ml	IMR	21 days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
59	PID SCREENING: Lymphocyte Activation Test (LAT)	Blood (Patient & Healthy control)	EDTA	5 ml	IMR	10 days	1) By consultation only. Case must be discussed with PID Officer. Please call 03-3362 8386/ 03-33627412/ 03-33627746/ 03-33627747/ 03-33627406/ 03-33628815/ 03-33627523. 2) Please send sample to Serology lab HSAJB before 10am , one day before the IMR appointment date. 3) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)
60	PID SCREENING: Dihydrorhodamine assay (DHR)	Blood	Lithium Heparin	2ml fresh blood from patient and 2 ml from unrelated healthy person (regardless of age and gender)	IMR	10 days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
61	Bruton Tyrosine Kinase(BTK) protein detection	Blood	EDTA	2 ml	IMR	10 days	<ol style="list-style-type: none"> 1) By appointment and consultation only. Case must be discussed with PID Officer. Please call 03-3362 8386/ 03-33627412/ 03-33627746/ 03-33627747/ 03-33627406/ 03-33628815/ 03-33627523. 2) A mother's blood is required to assist with interpretation. 3) Screening result MUST show Absence or less than 2% CD19+ B cells and Low serum antibodies, reduced BTK protein expression 4) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF) 5) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
62	Bruton Tyrosine Kinase (BTK) Genetic Test	Blood	EDTA	10 ml	IMR	90 days	<ol style="list-style-type: none"> 1) By appointment and consultation only. Case must be discussed with PID Officer. Please call 03-3362 8386/ 03-33627412/ 03-33627746/ 03-33627747/ 03-33627406/ 03-33628815/ 03-33627523. 2) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF Version) and consent form 3) A mother's blood is required to assist with interpretation 4) Screening result MUST show Absence or less than 2% CD19+ B cells and Low serum antibodies, reduced BTK protein expression 5) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
63	PID SCREENING: Lymphocyte Subset Enumeration Test (TBNK)/ T and B Cells enumeration	Blood	EDTA	2 ml	IMR	5 days	<ol style="list-style-type: none"> 1) By appointment only. Please call 03-33628386 for appointment. 2) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF) 3) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date.
64	Serum soluble CD25 detection by ELISA (a marker for hemophagocytic lymphohistiocytosis)	Serum	Plain tube	5 ml	IMR	21 working days	<ol style="list-style-type: none"> 1) By appointment and consultation only. Case must be discussed with PID Officer. Please call 03-3362 8386/ 03-33627412/ 03-33627746/ 03-33627747/ 03-33627406/ 03-33628815/ 03-33627523. 2) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF) 3) Please send sample to Serology lab HSAJB before 10am, one day before the IMR appointment date.

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
65	Immunoglobulin G subclass (IgG1, IgG2, IgG3, IgG4)	Serum	Plain tube	2-3 ml	IMR	21 working days	1) No appointment is required. Immediately send to the lab. 2) Primary Immunodeficiency (PID) Request Form (IMR/AIRC/PID/RF)
66	SKIN ANTIBODIES PANEL: (Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3)	Blood/serum	Plain tube	3-5 ml	IMR	14 days	1) Autoimmune request form (IMR/AIRC/Autoimmune/RF) 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
67	Specific Liver Antibodies (SLA) Panel: (Anti-AMA-M2, M2 3E/BPO, Sp100, PML, gp210, LKM1, LC-1, SLA/LP, Ro-52)	Blood/serum	Plain tube	3-5 ml	IMR	14 days	1) Compulsory to have Tissue antibodies result prior to send for this test 2) Autoimmune request form (IMR/AIRC/Autoimmune/RF) 3) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
68	BK Virus (BKV)/Jc Virus Genome Detection(PCR)	CSF Urine	Bijou bottle Sterile container	0.5 – 2 ml 5 ml	Hospital Sungai Buloh	2-5 days	4 copies of PERPAT Forms with specialist's stamp and signature.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
69	Cytomegalovirus (CMV) DNA Genome Detection (PCR)	Urine	Sterile container	5ml	Hospital Sungai Buloh	2-5 days	4 copies of PERPAT Forms with specialist's stamp and signature.
		CSF	Bijou bottle	1ml	Hospital Kuala Lumpur (HKL)	7 days	2 copies of PERPAT Forms with specialist's stamp and signature.
70	Chikungunya serology (IgM & IgG)	Serum	Plain tube	3-5 ml	Hospital Sungai Buloh	2-3 days	4 copies of PERPAT Forms with specialist's stamp and signature.
71	Chikungunya RT-qPCR	Blood, Serum, Plasma	Plain tube/EDTA tube	i) Blood: 5-10mls ii) Serum: 1-3mls iii) Plasma: 1-3mls	IMR	1-10 days	1) Virology Test Request form (IMR//VIRO/ADMIN/53) 2) Sample transported in ice
72	Dengue Multiplex RT-qPCR (Inclusive of DEN1, DEN2, DEN3 & DEN4)	i) Serum ii) Plasma iii) CSF iv) Organ biopsy	i) Plain tube ii) EDTA tube iii) Sterile leakproof container iv) Organ biopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist	i) Serum: 1-3ml ii) Plasma: 1-3ml iii) CSF: 1-3ml iv) Organ biopsy: About 1.5 cm cubes from various parts of affected organs	IMR	1-5 days	Virology Test Request form (IMR//VIRO/ADMIN/53)

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
73	Dengue Virus PCR	Blood/Serum	Plain tube	Blood: 5 ml/ Serum:2 ml	MKAJB	7 days	1) LABORATORY REQUEST FORM FOR DENGUE AND FLAVIVIRUS <i>MKAK-BPU-D02(rev_Nov_2015)</i> 2) Selected cases for DVSS (NS1 Ag positive or NS1 Ag & IgG positive only)
74	Enterovirus Isolation	<p>i) Acute Respiratory Syndrome: Refer to Respiratory Virus Isolation for specimen types.</p> <p>ii) Acute Hemorrhagic Conjunctivitis: Conjunctival swab.</p> <p>iii) Myocarditis/ Pericarditis: Throat swab; Rectal Swab; Stool; Pericardial fluid; Endomyocardial biopsy; Heart tissue.</p> <p>iv) Acute Neurological Syndrome: Throat swab; Rectal swab; Stool; Cerebrospinal fluid (CSF); Brain tissue.</p>	<p>i) Respiratory specimens: Refer to Respiratory Virus Isolation.</p> <p>ii) Swab specimens: Sterile leakproof vial containing 2-3 ml of VTM.</p> <p>iii) Pericardial fluid/ CSF/ Stool: Sterile leakproof container.</p> <p>iv) Tissue biopsy/ autopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist.</p>	<p>i) Respiratory specimens: Refer to Respiratory Virus Isolation.</p> <p>ii) Swab specimens: Sterile plastic-shafted polyester swab in VTM.</p> <p>lii) Pericardial fluid/ CSF: 1-3 ml.</p> <p>iv) Stool: >5 g (thumb size).</p> <p>v) Tissue biopsy/ autopsy: About 1.5 cm cubes of various parts of affected organs.</p>	IMR	28 days (Inclusive of PH and weekends)	Virology Test Request form IMR//VIRO/ADMIN/53

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
75	Enterovirus qRT-PCR (Inclusive of Pan Entero, EV71 and CA16)	i)Nasopharyngeal aspirate(NPA), ii)Nasopharyngeal swab (NPS)/ Oropharyngeal swab (OPS) /throat swab (TS) iii)Cerebrospinal fluid (CSF) /Bronchoalveolar lavage (BAL)/Sputum/ Pericardial fluid, iv)Vesicular Swab (Skin lesion)/ Rectal swab v)Organ biopsies, vi) Stool	i) NPA: Sterile leakproof container ii) NPS/OPS/ TS:in vial containing of VTM iii)Cerebrospinal fluid (CSF)/BAL/ Sputum : Sterile leak proof container i) Vesicular swab/rectal swab: in vial containing 2-3 ml VTM ii) Organ biopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist iii) Stool: Sterile leakproof bottle	i) NPA: 2-3ml ii)NPS/OPS/ TS: Swab in vial containing 2-3ml of VTM. iii)CSF: 1-3ml iv)BAL/sputum : 2-3ml v)Vesicular swab/rectal swab in vial containing 2-3 ml VTM iv) Organ biopsy: About 1.5 cm cubes from various parts of affected organs v) Pericardial aspirate: 1-2ml vi) Stool: >5gm (thumb size)	IMR	1-10 days	Virology Test Request form IMR//VIRO/ADMIN/53

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
76	Respiratory Virus Isolation and Identification (Influenza Virus A and B, Adenovirus, Respiratory Syncytial Virus, Parainfluenza Virus 1,2 and 3, Human Metapneumovirus)	i) Nasal aspirate/ wash (NA/ NW). ii) Nasopharyngeal aspirate/ wash (NPA/ NPW). iii) Nasopharyngeal swab (NPS). iv) Throat/ Tonsillar/ Oropharyngeal swab (OPS). v) Sputum/ Tracheal aspirate (TA)/Endotracheal aspirate (ETA)/Bronchial wash (BW)/ Bronchoalveolar lavage (BAL)/ Pleural fluid. vi) Tracheal/ Bronchial/ Lower airway/ Lung swab. vii) Tracheal/ Bronchial/ Lung tissue.	i) NA/ NW/ NPA/ NPW/ Sputum/ TA/ ETA/ BW/ BAL/ Pleural fluid: Sterile leakproof container. ii) Swab specimens: Sterile leakproof vial containing 2-3 ml of VTM. iii) Tissue biopsy/ autopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist.	i) NA/ NW/ NPA/ NPW/ TA/ ETA: 1-3ml of aspirate or wash. ii) Sputum/ BW/ BAL/ Pleural Fluid: 1-3ml. iii) Swab specimens: Sterile plastic shafted polyester swab in VTM. iv) Tissue biopsy/ autopsy: About 1.5 cm cubes from various parts of affected organs.	IMR	14 - 28 days (Inclusive of PH and Weekends)	1) Testing of non-respiratory specimens requires consultation. Please call 03-33628960/03-33628114 2) Autopsy specimens are NOT accepted for stillbirths or neonatal deaths less than 3 days old.

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
77	Epstein-Barr virus(EBV) Genome Detection (PCR)	CSF Bronchoalveolar Lavage(BAL)	Bijou bottle Sterile container	0.5 – 2 ml 5 ml	Hospital Sungai Buloh	2-5 days	4 copies of PERPAT Forms with specialist's stamp and signature.
78	Hepatitis C virus genotyping (Qualitative)	Plasma	EDTA	3-5 ml	Hospital Kuala Lumpur	30 days	<ol style="list-style-type: none"> 1) Criteria of sample: <ol style="list-style-type: none"> i. HCV viral load minimum 1000 IU/mL or Hepatitis C core Antigen positive ii. Relevant clinical history (i.e Liver cirrhosis) 2) Request form signed by Gastroenterologist/ Medical specialist 3) Request form: PERPAT 301 request form (2 copies)
79	Herpes Simplex virus 1/2 (HSV 1/2) Genome Detection (PCR)	Urine	Sterile container	5 ml	Hospital Sungai Buloh	2-5 days	4 copies of PERPAT Forms with specialist's stamp and signature.
		Plasma CSF Vesicle (STI)	EDTA Bijou bottle Dacron swab	5 ml 1ml	HKL	7 days	
80	HIV Drug Resistance Test (Integrase or Protease and Reverse Transcriptase)	Plasma	EDTA	10 ml	IMR	40 working days	<ol style="list-style-type: none"> 1) Please ensure that the patient's most recent viral load is > 1000 copies/mL 2) HIV Genotyping Resistance Testing Form (HIVDR request form: IMR/Viro/HIV/24) 3) Transport in ice

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
81	HIV-1 RNA RT PCR for babies (0-18 months)	Plasma	EDTA	2.5 mL of baby's blood collected in EDTA tube	IMR	5-10 days	Ujian Polymerase Chain Reaction (PCR) Untuk Human Immunodeficiency Virus (HIV) Di Kalangan Bayi (HIV PCR paed form :IMR/Viro/HIV/2)
82	Japanese encephalitis virus (Serology or PCR)	Serum	Plain tube	2-4ml	MKAK	Serology: 3-7 days	MKAK-BPU-U01/Rev2018
		CSF	Sterile container	1 ml	MKAK	PCR: 3 days	Sample should be collected within 5 days from onset of illness
83	Parvovirus B19 PCR	Serum/Bone marrow aspirate/CSF	Plain tube/Sterile container	1-3 ml	MKAK	3 days	MKAK-BPU-U01/Rev2018
84	Polio Virus and Non-Polio Enterovirus (Acute Flaccid Paralysis)	Stool (To collect within 14 days of onset, 2 adequate sample to collect in 24-48 hours apart)	Stool: Sterile leakproof bottle	Stool: >5 g (Thumb size)	IMR	14 days (Inclusive of PH and weekends)	Acute Flaccid Paralysis Case Investigation Form, Ministry of Health Malaysia For age >15 years old require consultation. Please call 03-33628960 / 03-33628114
85	Varicella-Zoster Virus (VZV) DNA Genome Detection (PCR)	Plasma CSF Vesicle (STI)	EDTA Bijou bottle Dacron swab	5 ml 1ml	Hospital Kuala Lumpur	7 days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
86	Rabies Virus RT-qPCR	After consultation only			IMR	1-5 days	1) By Consultation only. Please call 03-33628960/03-33628114 2) Virology Test Request form IMR//VIRO/ADMIN/53
87	Zika Virus RT-qPCR	After consultation only			IMR	1-5 days	1) Acute Neurological Syndrome 2) By Consultation only. Please call 03-33628960/03-33628114 3) Virology Test Request form IMR//VIRO/ADMIN/53
88	Echovirus 11 RT-qPCR	After consultation only			IMR	1-10 days	1) By Consultation only. Please call 03-33628960/03-33628114 2) Virology Test Request form IMR//VIRO/ADMIN/53
89	Human Papillomavirus DNA PCR (HPV DNA PCR)	Cervical specimens	Flexible flogswab (polyethylene or nylon)		IKN	14 working days	1) Request form: PER-PAT 301 with: -Patient details -Sample details -Patient history -Requestor information -Requestor's email address: for the test reporting 2) Transported at room temperature (Should not exceed 14 days after collection)

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
90	Adenovirus F41 qRT-PCR	After consultation only			IMR	1-5 days	1) Acute Gastrointestinal Syndrome, Acute Hepatitis of Unknown Origin in Children (age 1-18) 2) Virology Test Request form IMR/VIRO/ADMIN/53 3) Active by consultation only. Please call 03-33628960/ 03-33628114
91	Hantavirus RT-qPCR (Hantavirus Pulmonary Syndrome/Hemorrhagic Fever Renal Syndrome)	After consultation only			IMR	1-5 days	1) Acute Respiratory Syndrome, Acute Haemorrhagic Syndrome 2) By consultation only. Please call 03-33628960/03-33628114 3) Virology Test Request form IMR/VIRO/ADMIN/53
92	SARS-CoV-2 RT-qPCR	i) Cerebrospinal fluid (CSF) ii) Pleural fluid iii) Lung/ Heart/ Brain tissue	i) CSF/ Pleural fluid: Sterile leakproof container. ii) Tissue: Sterile leakproof vial containing 2-3 ml of VTM.	CSF/ Pleural fluid: 1-3 ml.	IMR	1-10 days	1) By consultation only. Please call 03-33628960/03-33628114 2) Virology Test Request form IMR/VIRO/ADMIN/53

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
93	Severe Fever with Thrombocytopenia Syndrome (SFTS) RT-qPCR	After consultation only					1) Acute Neurological Syndrome Acute Gastrointestinal Syndrome 2) By consultation only. Please call 03-33628960/03-33628114 3) Virology Test Request form IMR//VIRO/ADMIN/53
94	St Louis Encephalitis Virus (SLEV) RT-qPCR						
95	West Nile Virus RT-qPCR						
96	Monkeypox Virus-PCR (Mpox)	<u>Suspected or probable case</u> Lesion fluid from vesicles or pustules	i) Lesion Fluid Aspirate: Sterile polyester or Dacron swab in VTM ii) Lesion Fluid Swab: in VTM	1.5-2ml	MKAJB	48 Hours	1) To CONSULT Microbiologist on-call upon request 2) Triple packaging with ice. 3) Request form: MKAK-BPU-U01/Rev2018 (2 copies)
		Scab or crust	Scab/Crust : two scabs each from at least two body locations in separate sterile container	At least 4mm X 4mm			
		<u>Contact case</u> Tonsillar tissue Nasopharyngeal	Tonsillar Tissue Swab in VTM Nasopharyngeal Swab in VTM	1.5-2ml			

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
97	Measles PCR and/or Rubella PCR	i) Throat swab ii) Urine iii) Nasopharygeal secretion/ Tracheal aspirate	i) Flocked or Dacron swab in VTM ii) & iii) Sterile screw capped container	i) 2-2.5ml ii) 10 ml of urine (Early morning first void) iii) 1-3 ml	MKAJB	14 days	1) Specimen should be collected within 5 days from onset of illness. 2) Respiratory secretion should be taken 1-7 days of rash onset. 3) A brief concise history of illness and physical findings is required especially the date of onset of illness and the date of specimen collection. 4) Request form: Measles & Rubella/Congenital rubella syndrome (CRS)-Borang permohonan ujian makmal (MSLF: 02/Rev2024)
98	Measles IgM	Serum	Plain tube	3-5 ml	MKAJB	3-4 days	Request Form: Measles & Rubella/Congenital rubella syndrome (CRS)-Borang permohonan ujian makmal (MSLF: 02/Rev2024)

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
99	Measles IgG	Serum	Plain tube	3-5 ml	Hospital Sungai Buloh	2-3 days	4 copies of PERPAT Forms with specialist's stamp and signature.
100	Hepatitis D virus (HDV) IgM Antibody	Serum/Plasma	Plain tube/EDTA	1-3ml	IMR	1-10 days	1) Acute Gastrointestinal Syndrome Acute Jaundice Syndrome 2) Case by consultation. Please consult virologist IMR upon request, 03-33628960/03-33628114 3) Virology Test Request form IMR//VIRO/ADMIN/53
101	Hepatitis E virus (HEV) IgM Antibody	Serum, Plasma	EDTA tube	1-3 ml	IMR	1-10 days	
102	Nipah Virus Antibody	Serum, CSF, Plasma	i) Serum: Plain tube ii) CSF: Sterile leakproof container iii) Plasma : EDTA	i) Serum: 1-3mls ii) CSF: 1-3mls iii) Plasma: 1-3mls	IMR	1-10 days	Virology Test Request form IMR//VIRO/ADMIN/53
103	Nipah Virus qRTPCR	Serum CSF Organ biopsies	Leak-proof Sterile container	2 - 4ml 1 - 3ml Organ: 1.5 cm cube in VTM	MKAK	3 days	Borang Permohonan Ujian Makmal (Spesimen Klinikal) MKAK
104	HTLV I & II Antibody (Screening by ELISA)	Serum	Plain tube	1 ml	Hospital Kuala Lumpur (HKL)	7 days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
105	Confirmation for HIV-2	Plasma AND Serum	EDTA tube AND Plain tube	6 mL each tubes	IMR	5-10 working days	1) By consultation only (Please call 03-33628960 / 03-33628114) 2) Borang Ujian Serologi Bagi Penyakit Human Immunodeficiency Virus (HIV) (HIV NARL form: IMR/Viro/HIV/1)
106	HIV-2 RT-PCR	Plasma	EDTA	2.5 ml	IMR	1-5 days	Virology Test Request form IMR//VIRO/ADMIN/53
107	Crimean Congo Haemorrhagic Fever Virus (CCHFV) RT-qPCR	After consultation only			IMR	1-5 days	1) Acute Haemorrhagic Syndrome 2) By consultation only (Please call 03-33628960/03-33628114) 3) Virology Test Request form IMR//VIRO/ADMIN/53
108	Lassa Virus RT-qPCR						
109	Marburg Virus RT-qPCR						
110	Rift Valley Fever Virus RT-qPCR						
111	Yellow Fever Virus RT-qPCR						

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
112	Cytomegalovirus Isolation	i) Urine. ii) Cerebrospinal Fluid (CSF). iii) Bronchoalveolar lavage (BAL). iv) Tissue. v) Pericardial Fluid	i) Urine/ CSF/ BAL/ Pericardial fluid: Sterile leakproof container. ii) Tissue biopsy/ autopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist.	i) Urine/ CSF/BAL/ Pericardial fluid: 1-3 ml. ii) Tissue biopsy/ autopsy: About 1.5 cm cubes of various parts of affected organs.	IMR	14-35 days (Inclusive of PH and weekends)	1) Acute Respiratory Syndrome, Acute Neurological Syndrome, Acute Gastrointestinal Syndrome, Mononucleosis syndrome, Retinitis, Myocarditis, Pericarditis 2) Virology Test Request form (IMR//VIRO/ADMIN/53)
113	Ebola Virus RT-qPCR	After consultation only			IMR	1-5 days	1) Acute Haemorrhagic Syndrome 2) By Consultation only (Please call 03-33628960/03-33628114) 3) Virology Test Request form (IMR//VIRO/ADMIN/53)

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
114	Herpes Simplex Virus Isolation (Herpes Simplex 1 & 2)	i) Nasopharyngeal swab. ii) Throat swab. iii) Tissues: Brain, Heart, Lungs. iv) Rectal swab. v) Aspirates: Tracheal aspirate (TA), Endotracheal aspirate (ETA), Pericardial aspirate. vi) Vesicular swab/scraping. vii) Eye swab, lacrimal tears. viii) Cerebrospinal fluid (CSF). ix) Bronchoalveolar lavage (BAL). x) Bronchial washing (BW).	i) CSF/ Vesicular fluid/ TA/ ETA/ BW/ BAL/ Pericardial fluid/Corneal/ Conjunctival/ Lesion scrapings/Lacrimal tears: Sterile leakproof container. ii) Swab specimens: Sterile leakproof vial containing VTM. iii) Tissue biopsy/ autopsy: Sterile leakproof container containing VTM or sterile normal saline to keep tissue moist.	i) CSF/ BW/ BAL/ Pericardial fluid/TA/ ETA: 1-3 ml. ii) Vesicular fluid: aspirate fluid with a 26- to 30-gauge tuberculin needle and transfer to VTM by rinsing the needle with 1-2 ml VTM. iii) Corneal/ Conjunctival/ Lesion scrapings/Swab specimens: transfer to 2-3 ml VTM. iv) Lacrimal tears: 10-20 ul. v) Tissue biopsy/ autopsy: About 1.5 cm cubes organs.	IMR	14 - 28 days (Inclusive of PH and weekends)	1) Virology Test Request form (IMR//VIRO/ADMIN/53) 2) Consultation is required for the testing of tissue specimens other than brain, heart, and lungs.

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
115	MERS- CoV RT-qPCR	Organ biopsy	Sterile containers containing VTM or sterile normal saline to keep tissue moist	About 1.5 cm cubes from various parts of affected organ	IMR	1-10 days	1) By Consultation only. Please call 03-33628960/03-33628114 2) Virology Test Request form (IMR/VIRO/ADMIN/53)
116	JC virus genome detection	CSF	Bijou bottle	0.5-2ml	Hospital Sungai Buloh	2-5 days	4 copies PERPAT request form with specialist's signature.
117	PCR Test for detection of M.tuberculosis complex	Sputum, CSF, gastric lavage, bronchial washing, pus swab, body fluid, urine, tissue biopsy, blood, bone marrow aspiration.	Sterile container, plain tube (adult blood sample), Heparin tube (paediatric blood sample)	3-5 ml	MKAK	7 working days	1) For swab sample, call TB lab HSAJB to collect dacron swab prior to sample collection. 2) Request form: TBIS 20C or PERPAT Forms 3)
118	Detection of Mycobacterium tuberculosis and assess resistance to first line drugs (rifampicin and isoniazid) -(Line probe assay)	Sputum	Sterile container	3-5 ml	MKAK	7 working days	Request form: TBIS 20C or PERPAT Forms

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
119	TB Targeted Next generation sequencing (NGS) Drug susceptibility test (DST)	Culture Sputum (AFB positive or Genexpert positive-high/moderate)	Culture in solid/liquid media Sterile container	3-5 ml	IMR	4 weeks	1) Request by consultation to Dr Zamzurina Abu Bakar (03-40232966, EXT 107/ 013-3401564) 2) Indication: TB cases which are not responsive to treatment for 3 months 3) Request form: TB NGS LABORATORY REQUEST FORM: IMR/IDRC/BACT/TBNGS/01
120	Detection of Mycobacterium tuberculosis and assess resistance to second line drugs (Xpert MTB/XDR)	Sputum	Sterile container	3-5 ml	MKAK	7 working days	1) Consult MKAK to request the test 2) Indication of the test: for RR-TB & MDR-TB cases 3) Request form: TBIS 20C or PERPAT Forms
121	Interferon gamma release assays (IGRA)	Whole blood	IGRA tubes	1.0 ml each tubes (Total: 4 tubes)	MKAJB	10 days	1) Contact TB lab to get appointment for the collection of IGRA tubes. 2) Tubes collection at 9 am every Monday and the sample MUST sent to the Microb lab at 12pm on the same day
122	Mycobacteria other than Tuberculosis (MOTT) PCR / Non-tuberculous Mycobacteria (NTM), PCR	Sputum, pus, tissue, stool, FFPE block, CSF & other body fluids	Sterile container	For CSF and other body fluids 1-2 ml	IMR	10 days	1) Transport sample in ice 2) Tuberculosis laboratory request form (IMR/IDRC/BACT/TB/01)

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
123	Mycobacterium leprae PCR	Skin Incision / Punch Biopsy	a) Preferably in sterile plain container without preservative or	Minimum size of 4 mm x 12 mm (skin incision) or Minimum of 5 mm (punch biopsy).	MKAK	7 days	Request from: Borang Permohonan Ujian Kusta - LIS102C (MKAK)
124	Detection of drug resistant Mycobacterium leprae by Molecular Line Probe Assay Method (MLPA)		b) In container with 70% ethanol			14 days	Request from: Borang Permohonan Ujian Kusta - LIS102C (MKAK)
125	Culture & Sensitivity (Mouse Foot Pad Inoculation Method)		Sterile plain container without preservative			12-18 months	Mycobacterium leprae Viability & Drug Sensitivity Test Request Form (MKAK)
126	IgE, SPECIFIC	Serum	Plain tube	3 ml	IMR	10 days	1) Allergy request form: IMR/AIRC/Allergy/RF 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
127	IgE, TOTAL	Serum	Plain tube	3 ml	IMR	10 days	

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

NO	TEST	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	REFERRAL LAB	RLTAT	REMARK
128	TRYPTASE	Serum	Plain tube (1 plain tube and 1 request form for each sampling)	3 ml	IMR	14 days	<ol style="list-style-type: none"> 1) After anaphylaxis: <ul style="list-style-type: none"> • 1 st sample within 15 minutes up to 3 hours after the onset of the symptoms • 2 nd sample after 24-48 hours to confirm the return to baseline levels • 3 rd sample after 1-2 weeks if incidents of mastocytosis or other causes of elevated basal levels are suspected 2) For forensic sample, please specify sampling site, time of death and time of sampling. 3) Allergy request form: IMR/AIRC/Allergy/RF 4) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C
129	ECP (Eosinophilic Cationic Protein)	Serum	Plain tube	3 ml	IMR	30 days	<ol style="list-style-type: none"> 1) Allergy request form: IMR/AIRC/Allergy/RF 2) Sent immediately to the lab and ensure sample is transport in 2 - 8 °C

*All microbiological samples must be **SENT IMMEDIATELY** to the lab unless specified otherwise

LIST OF HAEMATOLOGY TESTS OFFERED FOR 24 HOURS SERVICES

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
1	Full Blood Count (FBC)	Whole Blood	K2/K3 EDTA	3 ml	4 hours	Transport samples within 4 hours of blood collection at room temperature
2	Full Blood Picture (FBP)	Whole Blood	K2/K3 EDTA	3 ml	Urgent: 1 day Routine: 3 days District: 7 days	1). Transport samples within 4 hours of blood collection at room temperature 2). For Urgent FBP, please contact Medical Officer/Haematologist On-Call
3	PT/INR/APTT	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	4 hours	Transport samples within 4 hours of blood collection at room temperature
4	Fibrinogen	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	4 hours	Transport samples within 4 hours of blood collection at room temperature
5	Thrombin Time	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	4 hours	Transport samples within 4 hours of blood collection at room temperature
6	D-Dimer	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	4 hours	1).Please call the Medical Officer before sending during and after office hours 2).Transport samples within 4 hours of blood collection at room temperature
7	ESR	Whole Blood	K2/K3 EDTA	3 ml	90 minutes	Transport samples within 4 hours of blood collection at room temperature

ROUTINE HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
8	G6PD SCREEN	Baby's Cord Blood/ Whole Blood (Adult only)	K2/K3 EDTA	3 ml	12 Hours	Transport samples within 4 hours of blood collection at room temperature
9	NAP Score	Whole Blood	Lithium heparin	3 ml	1 working day	Transport samples within 4 hours of blood collection at room temperature

SPECIALISED HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
10	Hb Analysis	Whole Blood, Slide	K2/K3 EDTA	3 ml	4 weeks	<p>1). Transport samples within 4 hours of blood collection or within 72 hours for District Hospital/Klinik Kesihatan with ice pack. Avoid direct contact with ice (20-25°C).</p> <p>2). For District hospital, required to send in PBF slide with latest <i>FBC indices</i> and attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi, HSAJB(HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y</p> <p>3). Please refer to Appendix: Lampiran D</p>
11	CD4 / CD8 Enumeration	Whole Blood	K2/K3 EDTA	3 ml	5 days	<p>1). Transport samples within 4 hours of blood collection or within 24 hours for District Hospital/Klinik Kesihatan with ice pack (20-25°C). Avoid direct contact with ice.</p> <p>2). CD4/CD8 test is available from Monday to Thursday only. Request form requires Specialist's signature and District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi, HSAJB(HSAJB/PAT-398/VER1.0/2024)-)- Refer Lampiran Y</p> <p>3). Further detail request CD4CD8 test Criteria, please Refer Lampiran A</p>
12	Bone Marrow Aspirate (BMA)	Bone Marrow	Direct smear K2/K3 EDTA	9 ml	5 days	<p>1). Transport samples within 4 hours of blood collection at room temperature</p> <p>2). For Appointment, please contact the lab. Urgent BMA, please call Specialists on-call</p> <p>3). Please refer to Appendix: Lampiran C</p>
13	Immunophenotyping (IPT)	Bone Marrow/ Peripheral Blood	K2/K3 EDTA	6 ml	All urgent reports - Verbal report within 24 hrs 5 working days	<p>1). Transport samples within 4 hours of blood collection within 24 hours for District Hospital, with ice pack (20-25°C). Avoid direct contact with ice.</p> <p>2). For Request, please call Specialists on call</p> <p>3). Please refer to Appendix: Lampiran E</p> <p>4) District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi, HSAJB(HSAJB/PAT-398/VER1.0/2024)-)- Refer Lampiran Y</p>

SPECIALISED HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
14	Immunophenotyping (IPT)	CSF	Bijou bottle or disposable conical transport	1-2 ml	Urgent for Acute Leukaemia: 24 hours (Verbal Report) Routine: 2 Weeks	1). CSF samples must be sent immediately and reach the lab within 1 hour of sampling to ensure viability of the cells. 2).For Request, please call Specialists on call 3). Please refer to Appendix: Lampiran E
15	Kleihauer	Fresh Whole Blood and Cord Blood Samples	K2/K3 EDTA	3 ml	2-3 days	Transport samples within 4 hours of blood collection at room temperature Requirement : Mother's Blood (As sample) * <i>Please contact Haematologist On-Call for appointment.</i>
16	Factor VIII Assay	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	Urgent: 1-3 days Routine: 2 weeks	1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma on dried ice. 2). For Urgent case, please contact Haematologist On-Call. 3). Please refer to Appendix: Lampiran F 4)District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi,HSAJB(HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y

SPECIALISED HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
17	Factor IX Assay	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x1 tube	Urgent: 1-3 days Routine: 3 weeks	<p>1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma in dried ice.</p> <p>2). For Urgent case, please contact Haematologist On-Call.</p> <p>3). Please refer to Appendix: Lampiran F</p> <p>4) District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi, HSAJB (HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y</p>
18	Lupus Anticoagulant	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x2 tubes	4 weeks	<p>1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma in dried ice.</p> <p>2) . Please use the Checklist for Thrombophilia testing in the Appendix :Lampiran H</p> <p>3) District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi, HSAJB (HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y</p>

SPECIALISED HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
19	Osmotic Fragility Test (OFT)	Fresh Whole blood	Lithium Heparin	4 ml	2 weeks	<p>1). Deliver tube immediately to the laboratory at room temperature on Monday to Thursday only.</p> <p>2). Please contact Haematologist On-Call for an appointment.</p>
20	Mixing Test	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x3 tubes	Urgent: 3 days Routine: 2 weeks	<p>1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma on dried ice.</p> <p>2). For Urgent case, please contact Haematologist On-Call.</p> <p>3) District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi,HSAJB(HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y</p>
21	Inhibitor Assay	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated mark x2 tubes	Urgent: 1-3 days Routine: 2 weeks	<p>1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma on dried ice.</p> <p>2). For Urgent case, please contact Haematologist On-Call. Please refer to Appendix: Lampiran F</p> <p>3)District hospitals to attach with Borang Penghantaran Spesimen Hospital Daerah/KK ke Jabatan Patologi,HSAJB(HSAJB/PAT-398/VER1.0/2024)- Refer Lampiran Y</p>

SPECIALISED HAEMATOLOGY TESTS

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
22	Factor VIII Inhibitor Screening	Blood (Plasma)	3.2% Trisodium Citrate	Collect until indicated markx2 tubes	Urgent: 1-3 days Routine: 2 weeks	1). Transport samples within 4 hours of blood collection at room temperature OR Separate plasma from cells as soon as possible. Freeze the plasma at -40°C and transport frozen plasma on dried ice. 2). For Urgent case, please contact Haematologist On-Call.
23	Molecular Quantitation of Major BCR-ABL1 (p210) for Chronic Myeloid Leukaemia (CML) Patients	Whole Blood	K2/K3 EDTA	6 ml	7 days	1). Transport samples within 4 hours of blood collection at 2 - 8 °C OR 24 hours (For District Hosp.) Avoid direct contact with ice. 2). <i>Chronic Myeloid Leukaemia</i> case. (Follow up only). Please refer to Appendix: Lampiran I
24	CD 20 Enumeration	Whole Blood	K2/K3 EDTA	3 ml	2 weeks	1). Transport samples within 4 hours of blood collection with ice pack (20-25°C). Avoid direct contact with ice. 2). For appointment, please contact Haematologist On-Call.
25	Pre-BALL Minimal Residual Disease (MRD)	Bone Marrow	K2/K3 EDTA	12 ml	6 weeks	1). Transport samples within 4 hours of blood collection within 24 hours for District Hospital, with ice pack (20-25°C). Avoid direct contact with ice. 2). For Request, please call Specialists on call. 3). Please refer to Appendix: Lampiran J

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL AMPANG

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
1	Paroxysmal Nocturnal Haemoglobinuria (PNH)	Whole Blood	K2/K3 EDTA	3 ml	Hospital Ampang	14 working days	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
2	BCR-ABL I (CML Case Only) (By Qualitative PCR)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	BMA (1-2 ml) PB (5 ml)	Hospital Ampang	5 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature 2). Never Freeze Specimens
3	BCR-ABL I (CML and Ph+ve ALL/AML Case) (By Quantitative RT-PCR)	Bone Marrow Aspirate (Ph+ ALL/AML case)/ Peripheral Blood (CML case)	K2/K3 EDTA	Follow-up: BMA (1-2 ml) PB (10 ml)	Hospital Ampang	7 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature 2). Never Freeze Specimens
4	Minor BCR-ABL1 (By Quantitative RT-PCR)	Bone Marrow Aspirate	K2/K3 EDTA	4 ml	Hospital Ampang	7 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature 2). Never Freeze Specimens
5	JAK2 / CALR Calreticulin (this test only carry out if JAK2V617F mutation negative (By Qualitative PCR)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	BMA (1-2 ml) PB (5ML)	Hospital Ampang	9 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL AMPANG

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
6	FLT3-ITD (AML: Diagnosis & follow-up) (By Qualitative PCR)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	BMA (1-2 ml) PB (5 ml)	Hospital Ampang	5 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
7	NPM1 (AML:Diagnosis & follow-up) (By Qualitative PCR)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	BMA (1-2 ml) PB (5 ml)	Hospital Ampang	5 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
8	PML-RARA (bcr1,bcr2&bcr3) [Monitoring] (By Quantitative RT-PCR)	Bone Marrow Aspirate	K2/K3 EDTA	Initial / Follow-up: BMA (1-2 ml)	Hospital Ampang	7 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
9	RUNX1-RUNX1 T1 [Monitoring] (By Quantitative RT-PCR)	Bone Marrow Aspirate	K2/K3 EDTA	Follow-up: BMA (1-2 ml)	Hospital Ampang	7 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL AMPANG

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
10	Cbfβ -MYH11A [Monitoring] (By Quantitative RT-PCR)	Bone Marrow Aspirate	K2/K3 EDTA	Follow-up: BMA (1-2 ml)	Hospital Ampang	7 weeks	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
11	Leukemia FISH Analysis (only) [FISH interphase analysis]	Bone Marrow Aspirate / Peripheral Blood	Sodium Heparin	BMA (1-2 ml) PB (5 ml)	Hospital Ampang	28 days	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
12	PDGFRA for Hypereosinophilia cases	Bone Marrow Aspirate / Peripheral Blood	Sodium Heparin	BMA (1-2 ml) PB (10 ml)	Hospital Ampang	28 days	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
13	Bone Marrow or blood (neoplasia) Chromosome study & Leukemia FISH Analysis	Bone Marrow Aspirate / Peripheral Blood	Sodium Heparin	BMA (1-2 ml) PB (5 ml) CLL Disease 10 ml)	Hospital Ampang	40 days	Monday to Thursday Only	1). Transport Samples Without Delay Within 24 Hours At Room Temperature. 2). Never Freeze Specimens.
14	ADAMTS 13	Blood (Plasma)	3.2% Trisodium Citrate	3 ml	Hospital Ampang	5-7 weeks	Monday to Friday	Deliver Tubes Immediately To Haematology Lab.

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL AMPANG

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
15	Serum Erythropoietin (EPO)	Blood (Serum)	Plain Tube	1.5 ml Serum	Hospital Ampang	MDS : 7-9 weeks MPN&PRV: 13 weeks	Monday to Friday	Deliver Tubes Immediately To Haematology Lab.
16	Anti-PF4 Antibody Testing	Blood (Serum)	Plain Tube With Gel	2 tubes	Hospital Ampang	14-18 weeks	Monday to Friday	Deliver Tubes Immediately To Haematology Lab.
17	Anti-Xa	Blood (Plasma)	3.2% Trisodium Citrate	Adult: 1 tube Paediatric: 2 tube	Hospital Ampang	3 weeks	Monday to Friday	Deliver Tubes Immediately To Haematology Lab.

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL)

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
17	DNA Analysis (Alpha Thalassaemia)	Whole Blood	K2/K3 EDTA	3 ml	Hospital Kuala Lumpur (Molecular Haematology Laboratory)	100 days	Monday to Friday	1). Attach With HB Analysis Result, And Latest FBC Indices Result (3 months validity) 2). Signed Consent Form

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL TUNKU AZIZAH KUALA LUMPUR (HTA)

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
18	Chromosome Studies (Paediatric Sample)	Whole Blood	Lithium Heparin	3-5 ml	Hospital Tunku Azizah (Genetic Laboratory)	Urgent: 20 working days Routine: 40-70 days	Monday - Thursday Only	1). Makmal Genetik Form (HTA/PATH.GEN/01-2021) 2). Fix appointment with Hosp.Tunku Azizah Genetics Lab
19	Bone Marrow Chromosome Analysis For Hematological Malignancies	Bone Marrow Aspirate	Sodium Heparin	FIRST 3-5 ml Of BMA	Hospital Tunku Azizah (Genetic Laboratory)	Urgent: 20 – 30 working days Routine: 40-70 days	Monday & Thursday Only	Makmal Genetik Form (HTA/PATH.GEN/01-2021)
20	vWF Profile	Blood (Plasma)	3.2% Trisodium Citrate	10 ml	Hospital Tunku Azizah (Haematology Laboratory)	8 weeks	Monday to Friday	PERPAT 301 Form

LIST OF HAEMATOLOGY TESTS OFFERED IN HOSPITAL TUNKU AZIZAH KUALA LUMPUR (HTA)

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
21	Rare Coagulation Factor Activity Assays(FVII,FXII,FXI,FX, FV,FII & FXIII)	Blood (Plasma)	3.2% Trisodium Citrate	3-5 ml	Hospital Tunku Azizah (Haematology Laboratory)	8 weeks	Monday to Friday	PERPAT 301 Form
22	Protein C, Protein S, Antithrombin, APCR	Blood (Plasma)	3.2% Trisodium Citrate	Adult: (6-7 tubes) Children 1-12 years old (4 tubes) Children <1 year old (2 tubes)	Hospital Tunku Azizah (Haematology Laboratory)	8 weeks	Monday to Friday	1)PERPAT 301 Form 2)For HSAJB patients only, to submit with 'Checklist for Thrombophilia Testing- (HSAJB/PAT-18/VER3.0/2022)
23	Platelet Receptor Flowcytometry Study	Blood (Plasma) Whole Blood	3.2% Trisodium Citrate K2/K3 EDTA	3 ml 3 ml	Hospital Tunku Azizah (Haematology Laboratory)	30 days	-	1)Only by appointment and patient have to be at HTA for blood collection. (Contact Pathologists at: 03-26003000 ext 1145/2169) 2)PERPAT 301 Form

LIST OF HAEMATOLOGY TESTS OFFERED AT INSTITUTE OF MEDICAL RESEARCH (IMR)

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
24	DNA Analysis For Thalassemia Syndromes & Haemoglobinopathies	Whole Blood	K2/K3 EDTA	3 ml	Institute Medical Research	130 working days	Monday to Friday	1). Latest Thalassemia Testing Form. 2). 3 months FBC Indices. 3). Signed Consent Form. 4). For Paediatric Samples, Must Be Accompanied With Parents' Sample.(Include Parent's Hb Analysis Result).
25	Acute Myeloid Leukaemia Study (FLT3 Gene)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5.0 ml	Institute Medical Research	30 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form.
26	Acute Myeloid Leukaemia Mutation Studies (AML Mutation Panel by NGS)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5.0 ml	Institute Medical Research	40 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form.
27	Chimerism Studies (Pre & Post Transplant)	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	10-20 ml	Institute Medical Research	40 working days	Monday & Thursday Only	1) Chimerism Analysis Form. 2) The Recipient Pre-HSCT Sample And Donor Sample Are Required.
28	Leukaemia Translocation Studies	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5 ml	Institute Medical Research	20 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form

LIST OF HAEMATOLOGY TESTS OFFERED AT INSTITUTE OF MEDICAL RESEARCH (IMR)

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
29	BCR::ABL1 Kinase Domain Mutation Analysis	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5 ml	Institute Medical Research	40 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form
30	BCR::ABL1 Qualitative Diagnostic Analysis	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5.0 ml	Institute Medical Research	20 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form
31	cKIT D816V Mutation Analysis	Bone Marrow Aspirate / Peripheral Blood	K2/K3 EDTA	2.5-5.0 ml	Institute Medical Research	30 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form
32	Haemophilia A Genetic Testing	Whole Blood	K2/K3 EDTA	2.5 ml	Institute Medical Research	70 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form Index and family members (especially mother) blood must be sent together with complete clinical data
33	Haemophilia B Genetic Testing	Whole Blood	K2/K3 EDTA	2.5 ml	Institute Medical Research	40 working days	Monday & Thursday Only	Molecular Analysis For Leukaemia Form Index and family members (especially mother) blood must be sent together with complete clinical data

LIST OF HAEMATOLOGY TESTS OFFERED AT HOSPITAL MELAKA

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
34	G6PD Quantitative Assay	Whole Blood	K2/K3 EDTA	Paediatric: 1 ml Adult: 2 ml	Hospital Melaka	14 days	Monday & Wednesday Only	1) Please make appointment with Haematology lab, Hosp.Melaka 2) Rejection criteria: -Reticulocyte count > 5.0% in neonates -Reticulocyte count > 2.5% in paediatric (>1 month of age) & adults

LIST OF HAEMATOLOGY TESTS OFFERED AT HOSPITAL SULTANAH BAHYAH, KEDAH

NO	TESTS	SPECIMEN TYPE	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	CENTER	LTAT	DAY OF DESPATCH	REMARKS
35	Ujian Molekular Southeast Asian Ovalocytosis	Whole Blood	K2/K3 EDTA	Paediatric: 1 ml Adult: 3 ml	Hospital Sultanah Bahiyah, Kedah	100 days	Monday & Wednesday Only	1) FBP report together with FBC parameters (less than 3 months) 2) Submit with Consent Form (HSBAS PAT HEM PP 5.09)

- More details are available at:
 - IMR Test Lists at : <https://www.imr.gov.my/testlist>
 - HKL Pathology Services at : <https://hkl.moh.gov.my/images/content/Jabatan/patologi/my/Buku%20Perkhidmatan%20Patologi%202024.pdf>
 - Hosp. Ampang Handbook :
<https://jknSelangor.moh.gov.my/hampg/images/2024/HANDBOOK%20OF%20PATHOLOGY%20SERVICES%208TH%20EDITION%202024.pdf>



1. **List of services provided**

- a. Routine Histopathology
- b. Histochemistry (special stains)
- c. Immunohistochemistry
- d. Immunofluorescent microscopy
- e. Chromogenic in situ hybridisation (CISH)
- f. Frozen section
- g. Clinical Autopsy

2. **Location**

Histopathology laboratory, Level 4th, Pathology Department, Hospital Sultanah Aminah Johor Bahru, Jalan Persiaran Abu Bakar Sultan, 80100 Johor Bahru.

3. **Service Hours**

- a. Laboratory
 - i. Monday to Friday: 8 am to 5 pm
 - ii. Saturday, Sunday and public holidays: Closed
- b. Frozen Section
 - i. We offer frozen section services to Hospital Sultanah Aminah (HSAJB) and Hospital Sultan Ismail Johor Bahru (HSIJB).
 - ii. All frozen sections are available during office hours.
 - iii. For transplant and organ donation cases, the service is available for 24 hours.
- c. Clinical Autopsy
 - i. 24 hours service

4. **Contact number**

- a. Histopathology laboratory: 2364
- b. Microscopic room: 2666
- c. Histopathologist can be contacted through the hospital operator or oncall list.

5. Services

- a. General (routine) histopathology
 - i. Use of PER-PAT 301 request form (2 copies).
 - ii. If report is required urgently, please remark the request form as 'URGENT' clearly on the top right- hand corner.
 - iii. All request forms should be filled legibly, complete with relevant clinical history and findings, and must have at least name of patient, identification number, age, history, clinical diagnosis including differentials if relevant, necessary laboratory investigations, necessary radiological imaging (CT scan/ Ultrasound/ MRI), name of house officer, medical officer or specialist, ward, date, and time specimen taken.
 - iv. Identification of the specimen and type of specimen on the specimen container and on the request form, should be identical and clearly written.
 - v. Rejection criteria
Specimen rejected if the criteria below is not fulfilled :
 1. Patient name/RN/IC no- Incomplete /not available/ not clear
 2. Patient's particular on form and specimen does not tally/incomplete
 3. Incorrect labelling
 4. No evidence of payment for foreigner
 5. No relevant clinical information and/or diagnosis
 6. No name, signature & stamp by clinician
 7. Specimen without request form/ damage request form
 8. Specimen not included inside the container
 9. Number of specimens does not tally with the request form

Note: Specimen processing is delayed if PER-PAT 301 form is incompletely filled, or data is discrepant. This may delay HPE reporting
- b. Frozen section
 - i. All requests must be preceded by appointment and discussion with the pathologists on call at least a day before the operation with the MO/Pathologist on call for frozen. For emergency frozen section cases that are decided on the operative day, should be discussed directly with the pathologist on call for frozen section.
 - ii. MO pathology will fill up frozen section request form.
 - iii. All cases scheduled for frozen section are best placed as the first case, so that it can be done within working hours.

- iv. At the time of frozen section, sample will be sent along with 2 copies of PER-PAT 301 forms to the lab, with contact number of the clinician in charge and extension number of the operation theatre clearly written. Sample is to be placed in clean container, without formalin, with frozen ice pack in ice box.
 - v. Preliminary report will be informed to the MO/surgeon in charge of the case.
 - vi. Request for oil red o stain on autopsy cases to be made by forensic pathologist to histopathologist oncall frozen section. Staining will be carried out during working hours. If the autopsy performed during weekend, the sample shall be kept in a freezer and send to the lab on next working day.
- c. Clinical autopsy
- i. Clinical autopsy is conducted in non-medicolegal cases, to help to establish cause of death. The service is provided for patients who are deceased in Hospital Sultanah Aminah Johor Bahru and districts hospitals of the southern region (Hospital Sultan Ismail, Hospital Kluang, Hospital Pontian, Hospital Kulai, Hospital Kota Tinggi, Hospital Mersing).
 - ii. The requesting doctor should obtain written consent from the next of kin (Surat Pekeliling Ketua Pengarah Kesihatan Malaysia Bil. 17/2008).
 - iii. The clinician who requested for post-mortem should communicate directly with the Medical Officer Histopathology on call or Pathologist on call of clinical autopsy.
 - iv. The clinical summary, including case notes and consent form should be given to the Pathologist on call.
 - v. The requesting specialist from the clinical department is required to be present during autopsy.
 - vi. The autopsy will be conducted in the mortuary of the respective hospital.
- d. Request for further ancillary testing such as immunohistochemistry.
- i. PER-PAT 301 form filled up with the relevant details and patients' information and indication.
- e. Request for molecular studies
- i. We do not provide service of molecular studies, but we can refer out by sending out the slides to reference laboratories.
 - ii. Request form (as required or as provided by reference laboratory) detailing patients name, IC, lab report number, brief clinical history and clinician's signature and the test required.

- f. Referral cases
 - i. The consultant in respective fields should be consulted prior to sending cases for expert opinion.
 - ii. The requesting doctor is required to fill up the request form as per routine and submit to the histopathology lab together with the specimen (paraffin embedded tissue, stained and/or unstained slides). Paraffin embedded tissue block is preferred as the case may need further ancillary studies.

6. Specimen collection and container

- a. The specimens are received with request forms placed in a separate compartment to prevent spillage of fixative. The specimens should be placed in a proper yellow screw cap containers (small specimens or biopsies) or disposable plastic specimen container (small or big robust containers).
- b. Routine histopathological specimens are to be fixed in 10% Neutral Buffered Formalin (NBF) with volume of formalin at least 10 times that of the specimen to ensure adequate fixation. The specimen should be placed in adequately sized containers without causing distortion or compression to the specimen.
- c. Ensure the patient's name, identification number and specimen type on the container tallies with the request form and checklist.
- d. Specimen from different anatomical sites should be sent in separate containers, properly labelled and must be clearly itemized in the request form.
- e. The margins of specimens should be adequately tagged with tagging indicated in the request forms for cases that require confirmation regarding the adequacy of resection margins.
- f. Frozen section sample should be sent in a clean container without fixative.
- g. For immunofluorescence studies, two specimens are required:
 - i. Formalin fixed tissue for light microscopy examination (received in 10% NBF)
 - ii. Fresh tissue for immunofluorescence staining, received without fixative.

7. Dispatch and transportation of Histopathology specimen.

- a. Specimens for routine histopathological examination should be sent in formalin to histopathology counter.
- b. Fresh tissue for frozen section and immunofluorescence should be sent immediately to the histopathology counter. If delay is expected, please refrigerate and transport in 2-8°C.

8. Critical result

- a. All cases with critical result will be notified to the clinicians.
- b. Critical result include presence of any unexpected abnormal findings, cell or organisms which may cause imminent danger to the patient, and/or require immediate medical attention.
 - i. Unexpectant or discrepant findings
 - ii. Report of infections
 - iii. Report on critically ill patients requiring therapy
 - iv. Cases that have immediate consequences

9. After office hours specimens

- a. All routine histopathological specimen taken after office hours should be fixed in the usual manner (10% NBF) in the respective OT/clinic or ward and kept at room temperature. The specimen should then be dispatched to the Histopathology Laboratory during operating working hours.

10. Laboratory Turn Around Time (LTAT)

- a. Advice to include the requesting Doctor's name and contact number on the request form for further clarification and information about the case.

Type of Sevices/Test	LTAT
Frozen Section	30 minutes per specimen
Urgent biopsy (without ancillary test, less than 3 bottles)	3 working days
Routine Specimen	2 to 4 weeks
Clinical Autopsy	3 months from official request of medical report

11. Access to histopathology (HPE) reports

- a. A hard copy of HPE report will be given to the clinician from district hospitals.
- b. Soft copy of HPE reports can be accessed by clinicians in HSAJB and by laboratory staff in department of pathology in Hospital Sultan Ismail (HSI) via Laboratory Information System (LIS).

12. Interdepartmental clinicopathological conference

- a. Clinicopathological Conference (CPC) are conducted with clinical departments in HSAJB and HSIJB. The planned schedule is released once a year.
- b. The list of patients to be discussed in CPC are required to be submitted to the medical officer in charge at least 1 week prior to the scheduled date. This is to allow us sufficient time to retrieve the slides and for adequate presentation if required. It is advised to also list down the discussion points.

13. Taking out paraffin blocks/slides /image from anatomic pathology unit

- a. Patients' paraffin blocks and slides are archived in histopathology laboratory.
 - i. Paraffin blocks, including paraffin blocks from frozen section are stored for 20 years.
 - ii. Slides will be stored for 7 years.
- b. For certain valid reasons, the unit allows the clinician to take the diagnostic material (Paraffin blocks/ slides) from the unit. The following procedures must be followed:
 - i. The request to get the diagnostic material must be made by a medical officer or specialists.
 - ii. The requestor needs to fill up 'Borang Permintaan Bahan Makmal Bagi Jabatan Patologi HSAJB' HSAJB/PAT-03/VER 1.0/2014. This form is available at histopathology unit.
 - iii. Request to kindly return the blocks or slides taken to our department once the case has been reported, within a period of 6 months.

14. Taking out tissue from Histopathology laboratory

- a. All remaining tissue specimens after grossing and empty specimen bottle will be kept in Histopathology laboratory for 1 month after issue of report.
- b. The patient or next of kin must make a formal request by filling up the form 'Borang Tuntutan Sampel Tisu HSAJB' HSAJB/PAT-16/VER1.0/2020.
- c. The tissue will be released only after the specimen is reported.
- d. If the tissue is not collected by respective next of kin by 1 months, the tissue will be discarded.

15. Request to obtain microscopic image

- a. Request for any microscopic images for interest, presentations and / or publications.
- b. Kindly contact the reporting pathologists to get the respective microscopic images.

16. Research

- a. The histopathology unit welcomes research projects or studies to be done in collaboration with our unit.
- b. All research projects from HSAJB shall be registered with CRC HSAJB. A full proposal along with NMRR and/or MREC approval shall be submitted for review. These will be forwarded to the Head of Pathology Department for site approval.
- c. All research projects from other centres shall write into the Director of HSAJB and CRC HSAJB for approval, along with accompanying full proposal and NMRR and/or MREC approval letters for review. These will be forwarded to the Head of Pathology Department for site approval.

- d. One pathologist from the unit shall be appointed as a collaborator or co-researcher, if possible, to facilitate retrieval of materials / records required.
- e. Only copy of records and / or unstained slides and / or tissue curls will be provided for research depending on the availability of the tissue. No tissue blocks or archival material is allowed to be taken out from the Histopathology Unit.

1. **List of services provided**

- a. Exfoliative Cytology
 - i. Gynaecological Cytology (Cervical Pap Smear)
 - a. Conventional pap smear
 - b. Fluid-based pap smear
 - ii. Non-Gynaecological Cytology –body fluid, cerebrospinal fluid (CSF), urine, sputum, brushing and seminal fluid analysis.
- b. Aspiration Cytology
 - i. Fine Needle Aspiration Cytology, cell block etc.

2. **Service Hours**

Monday to Friday: 8.00 am- 5.00 pm
 Saturday, Sunday and public holiday closed

3. **Receiving Counter**

- a. Cytology Laboratory, Level 4, Pathology Department HSAJB

4. **Contact Number**

- a. Cytopathology Laboratory: 2795
- b. Microscopic room : 2666

5. **Request Forms**

- a. PER-PAT 301 form for routine cytological examination (Non-Gynaecological Cytology and Fine Needle Aspiration):
 - 1 copy from HSAJB
 - 2 copies from other hospitals / klinik kesihatan
- b. PS 1/98 (Pindaan 2019) form for gynaecological cytology examination:
 - 1 copy from HSAJB
 - 2 copies from other hospitals / klinik kesihatan
- c. All request forms should be filled legibly, complete with relevant clinical history and findings, and must have at least below:
 - i. Name of the patient
 - ii. Patient identity card (I/C) number or/and hospital register number (RN) or/and any unique identity number
 - iii. Gender
 - iv. Age
 - v. Ward/Clinic
 - vi. Test requested
 - vii. Time and date specimen taken

d. The clinician should have his/her name, designation and department with signature clearly written on the request form.

e. If urgent result is required, please indicate so by marking 'URGENT' over the upper right-hand corner of the form.

f. Rejection criteria

Specimen rejected if the criteria is not fulfilled

- i. Patient name/RN/IC no- Incomplete /not available/ not clear
- ii. Patient's particular on form and specimen does not tally/incomplete
- iii. Incorrect labelling
- iv. No evidence of payment for foreigner
- v. No relevant clinical information and/or diagnosis
- vi. No name, signature & stamp by clinician
- vii. Specimen without request form/ damage request form
- viii. Specimen not included inside the container
- ix. Number of specimens does not tally with the request form.

6. **Specimen Collection**

a. Gynaecological Cytology

i. Conventional

- a. Label a clean glass slide with patient's name and IC number with pencil on the frosted end
- b. DO NOT use lubricant on the speculum
- c. Place cervical spatula at the external os and rotate through 360°, lightly scraping the squamo- columnar junction
- d. Smear the material onto the labelled glass slide
- e. Fix the slide immediately, either by immersing it in a Coplin jar containing 95% alcohol for at least 30 minutes or use a spray fixative
- f. Air dry the fixed slide
- g. Place the slide in a slide mailer and dispatch to the cytology laboratory

- ii. Fluid Based
 - a. Label the vial with patient's name and IC number
 - b. DO NOT use lubricant on the speculum
 - c. Obtain an adequate sample from the cervix using a provided brush.

Insert the provided brush into the endocervical canal. Rotate brush 5 times in a clockwise direction. Insert the contoured end of the pap perfect plastic spatula and rotate 360 ° around the entire ectocervix.
 - d. Snap the device handle and drop the detachable head of the device into the provided vial.
 - e. Tighten the cap and send the vial to the cytology laboratory.

- b. Sputum
 - i. In the morning after waking up, rinse the mouth with water to remove contaminants.
 - ii. The patient should then cough deeply into a clean container.
 - iii. The specimen must be sent immediately to the cytology laboratory.
 - iv. Ideally 3 consecutive days samples should be obtained, depending on clinical situation.
 - v. Method of collection should be stated in the request form (cough out sputum / post scope sputum). The specimen container should be labelled with the patient's name, IC number and sample type.

- c. Urine
 - i. Collect the next voided urine and send immediately to the cytology laboratory (amount as collected). Method of collection should be stated in the request form (voided / catheterised / bladder washing)
 - ii. For urine decoy cell, collect preferably the second voided urine and send immediately to the lab within an hour. Prior to the procedure, an appointment with the lab is required.

- d. Body fluids (Pleural fluid, peritoneal fluid, pericardial fluid, CSF, synovial fluid, cyst fluid, nipple discharge etc)
 - i. Specimens are collected in clean containers and dispatched immediately to the cytology laboratory.
 - ii. If delay is anticipated, refrigerate at 2-8°C.

- iii. Fluid for eosinophils, an appointment with the lab is required prior to the procedure. The collected sample must be sent immediately to the lab within an hour.
- iv. Nipple discharge:
wet smears: soak in 95% alcohol immediately after collection for 30 minutes.
dry smears: let the smear (on glass slide) dry at room temperature
- e. Brushing (Bronchial brushing, CBD brushing, etc)
 - i. Label two clean glass slides with patient's name and IC number.
 - ii. Smear the material onto the labelled glass slide.
 - iii. Immediately place the slides in 95% alcohol for at least 30 minutes or use spray fixative.
 - iv. If more than one slide is to be placed in the same slide mailer, ensure that they are not placed face to face.
- f. Bronchoalveolar lavage (BAL) and bronchial washing
 - i. Specimens are collected in clean containers (amount as collected) and dispatched immediately to the cytology laboratory. The specimen container should be labelled with the patient's name, IC number and sample type.
 - ii. If delay is anticipated, refrigerate at 2-8°C.
- g. Vitreous fluid
 - i. Store the collected sample into a clean Bijou bottle. Add cell block solution. The volume of the cell block solution transferred must be equal to that of the sample collected (1:1). The Bijou bottle and cell block solution are collected prior to procedure from the lab. The sample is sent to the laboratory as soon as possible.
- h. Seminal fluid analysis (SFA)
 - i. The hospital / klinik kesihatan should first call the cytology lab to arrange an appointment for the Seminal Fluid Analysis (SFA).
 - ii. On collection day, the patient should use the clean container provided to collect the sample and send it to the lab within an hour from the time of collection (except for vasectomy cases).
 - iii. Patient should write the time and date of specimen collection.

- i. Fine Needle Aspiration Cytology (FNAC)
 - i. The FNAC clinic is conducted once a week at the Surgical Follow-up Clinic (SFUC) HSAJB for palpable lesions on appointment basis. This applies for inpatient as well outpatient. Please get an appointment from Surgical Department or ENT Department in accordance with their policy and procedure.
 - ii. FNAC for non-palpable or deep-seated lesions are conducted at Radiology Department by respective Clinician in accordance to Radiology Department policy and procedure.
 - iii. FNAC shall:
 - a. Be requested by specialists or medical officer under specialist supervision.
 - b. The request form shall be filled legibly, complete with relevant clinical history and findings. Whenever there is more than one lump or swelling present, the clinician should indicate which lump/s or swelling/s to be aspirated.
 - c. A signed consent from the patient shall be obtained by the aspirator during FNAC at SFUC. The aspirator explains to the patient regarding the procedure including limitation and possible adverse effect etc.
 - iv. Please note that:
 - a. Breast and thyroid cyst may be aspirated by the aspirator and material sent for cytology examination
 - b. Vascular lesions or those of vascular origin are not suitable for FNAC.
 - c. FNAC for deep seated lesions are performed by radiologist under image guidance on appointment basis. Please refer to Radiology Department policy and procedure.

7. Specimen's labelling

- j. All request specimen's bottle should be filled legibly, completely and must have at least below:
 - i. Name of the patient (similar as in the request form)
 - ii. Patient identity card (I/C) number or/and hospital register number (RN) or/and any unique identity number (similar as in the request form).
 - iii. Type of specimen and site of specimen

8. Despatch & transportation of specimen

- a. Specimen should be sent immediately preferably within one hour to cytology laboratory.
- b. Specimen collected after office hours should be kept in refrigerator at 2-8°C
- c. Body fluids for cytological examination from external institutions should be transported in optimum temperature (2-8°C)

9. Critical notification

- a. All cases with critical result will be notified to the clinicians.
- b. Critical value is deemed as
 - i. Unexpectant or discrepant findings (malignancy when not clinically suspected)
 - ii. Infections (organisms in CSF).

10. Laboratory Turn Around Time

Test	LTAT	LTAT (URGENT)
Pap Smear	Conventional (4 weeks) LBC (2 weeks)	Not applicable
Non Gynae	2 weeks	3 working days
FNAC	2 weeks	3 working days

11. Access to Cytology reports

- c. A hard copy of the Cytology report will be given to the clinicians from district hospitals.
- d. Soft copy of Cytology reports can be accessed by clinicians in HSAJB and the laboratory staff in Department of Pathology, HSIJB via Laboratory Information System (LIS).



LIST OF TESTS OFFERED AT HISTOPATHOLOGY LABORATORY

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
1	Routine HPE	Small biopsy	Yellow screw-cap container / 10% neutral buffered formalin (NBF)	Minimum ratio of 10:1 10%NBF:tissue	Urgent:3 working days Non-urgent: 2 weeks	Urgent sample TAT is 3 days without further ancillary tests
2	Routine HPE	Surgical resection	Disposable plastic specimen container (Robust) / 10%NBF)	Minimum ratio of 10:1 10%NBF: tissue	2 weeks	Without further ancillary tests
3	Immunofluorescence (IF)	Fresh tissue	Yellow screw-cap container / Petri dish	N/A	2 weeks	Inform laboratory before sending the specimen and send immediately. If delay is anticipated, put few drops of normal saline to prevent drying and send in 2-8°C.
4	Frozen section (FS)	Fresh tissue	Yellow screw-cap container	N/A	30 minutes per specimen	Contact MO for appointment at least one day before. Emergency FS should be discussed between surgeon and pathologist. Send immediately to Histopathology laboratory.

ANATOMIC PATHOLOGY UNIT – OFFERED TEST DURING OFFICE HOUR

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
5	Referred case received for 2 nd opinion or ancillary test.	Block, stained slides and/or unstained slides	N/A	N/A	2-6 weeks depends on complexity	Include referral letter/PER- PAT 301 form and previous HPE Report
6	Oil red O stain	Fresh tissue	Yellow screw-cap container	N/A	Slide interpreted by Forensic Pathologist	Request for oil red o stain on autopsy cases to be made by forensic pathologist to histopathologist oncall frozen section. Staining will be carried out during working hours.

LIST OF TESTS OFFERED AT CYTOLOGY LABORATORY

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
7	Gynae	Conventional	Smear on glass slide and fix with 95% alcohol	N/A	2 weeks	Fix slide immediately in 95% alcohol or spray fixative
8	Gynae	Liquid based cytology	Sample collected in vial containing fixative	N/A	2 weeks	Vial supplied by the cytology laboratory
9	Non-Gynae	Body fluids	Yellow screw-cap container	As collected	Urgent: 3 working days Non-urgent: 2 weeks	Send immediately to Cytology Laboratory for processing. If delay is anticipated refrigerate specimen at 2-8°C.
10	Non-Gynae	Cerebrospinal fluids (CSF)	Bijou bottle	As collected	3 working days	Send immediately to Cytology Laboratory for urgent processing. If delay is anticipated, refrigerate specimen at 2-8°C
11	Non-Gynae	Bronchial Brushing	Glass slides	-	Urgent: 3 working days Non-urgent: 2 weeks	Fix slide immediately in 95% alcohol or spray fixative. If delay is anticipated, refrigerate specimen at 2-8°C
12	Non-Gynae	Bronchial Washing / Bronchial Alveolar Lavage	Yellow screw-cap container	As collected	Urgent: 3 working days Non-urgent: 2 weeks	Send immediately to Cytology Laboratory for processing. If delay is anticipated refrigerate specimen at 2-8°C.

ANATOMIC PATHOLOGY UNIT – OFFERED TEST DURING OFFICE HOUR

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
13	Non-Gynae	Sputum/ urine/ gastric lavage	Yellow screw-cap container	As collected	Urgent: 3 working days Non-urgent: 2 weeks	Send immediately to Cytology Laboratory for processing. If delay is anticipated refrigerate specimen at 2-8°C.
14	Non-Gynae	Urine for Decoy Cell	Yellow screw-cap container	As collected	24 hours	i) Collect preferably the second voided urine and send it immediately to the lab within an hour ii)An appointment with the lab is required prior to the procedure
15	Non-Gynae	Nipple discharge	Yellow screw-cap container/ Glass slide	As collected	Urgent: 3 working days Non-urgent: 2 weeks	1) Send immediately to Cytology Laboratory for processing. If delay anticipated refrigerate specimen at 2-8°C. 2) If send glass slides: i) wet smears: soak in 95% alcohol immediately after collection for 30 minutes ii) dry smears: let the smear (on glass slide) dry at room temperature
16	Non gynae	vitreous fluid (fluid from eye)	Bijou bottle	As collected	3 days to 2 weeks (if immunohistochemistry is required)	The collected sample that is mixed with cell block solution in equal volume (1:1) inside a clean Bijou bottle is sent to the laboratory as soon as possible.

ANATOMIC PATHOLOGY UNIT – OFFERED TEST DURING OFFICE HOUR

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
17	Non Gynae	Fluid for eosinophils	Yellow screw-cap container	As collected	3 working days	i)An appointment with the lab is required prior to the procedure ii) The collected sample must be sent immediately to the lab within an hour
18	Non Gynae	Seminal Fluid Analysis (SFA)	Yellow screw-cap container	As collected	3 working days	i)An appointment between the hospital / klinik kesihatan and the cytology lab is required prior to the procedure. ii) The patient should send the sample to the lab within an hour from the time of collection (except for vasectomy cases). iii.Patient should write the time and date of specimen collected
19	Fine Needle Aspiration (FNAC)	FNAC from various organs	1). 2 wet smears (glass slide)– soak in 95% alcohol immediately after collection for 30 minutes 2). 2 dry smears – let the smear (on glass slide) dry at room temperature	N/A	Urgent: 3 working days Non-urgent: 2 weeks	For wet smear fix slide immediately in 95% alcohol or spray fixative

ANATOMIC PATHOLOGY UNIT – OFFERED TEST DURING OFFICE HOUR

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
20	Cell Block	Body fluid From various organs	Collect the fluid in cell block solution.	As collected	2 weeks	N/A
21	Cell Block	FNAC specimens	Collect the fluids in cell block solution.	As collected	2 weeks	N/A

LIST OF ANATOMIC PATHOLOGY TESTS OFFERED BY REFERENCE LABORATORIES

NO	TESTS	SPECIMEN TYPE	CONTAINER	VOLUME	REFERRED HOSPITAL	RLTAT	DAY OF DESPATCH	REMARKS
1	HER-2 Dual Probe In Situ Hybridization (DDISH)	Paraffin block, stained and unstained slides	N/A	N/A	Histopathology Lab, Pathology Dept, Hospital Kuala Lumpur	30 days	Upon request	N/A
2	Molecular Testing, Fluorescence In-Situ Hybridisation (FISH) (eg: 1p19q, ALK for NSCLC, etc)	Paraffin block and Unstained slides	N/A	N/A	Molecular Histopathology Lab, Hospital Kuala Lumpur	30 days	Upon request	N/A
3	Molecular Testing, Polymerase Chain Reaction (PCR) (eg: BRAF, KRAS, etc)	Paraffin block and Unstained slides	N/A	N/A	Molecular Histopathology Lab, Hospital Kuala Lumpur	30 days	Upon request	N/A
4	Cancer Genetic (eg:EGFR mutation testing, KRAS mutation testing, Microsatellite Instability Testing, etc)	Unstained slide	N/A	N/A	Molecular Genetic Lab, Hospital Tunku Azizah	30 days	Upon request	N/A

IMPORTANT NOTES

- 1) Laboratory turn around time (LTAT)- refers to the time between specimens received by the laboratory to the issuing of the final pathologist's report.
- 2) The referral laboratory turn around (RLTAT) time stated in this handbook refers to the turn around time claimed by the referral laboratory. This does not include specimen handling and transportation as well as time taken for the reports to be received by the respective laboratories in the HSAJB Pathology Department.

LIST OF CHEMICAL PATHOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
1	Alanine Transaminase (ALT)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
2	Albumin	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
3	Aspartate Transaminase (AST)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
4	Alkaline Phosphatase (ALP)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
5	Bilirubin, Total	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Please protect from light source.
6	Bilirubin, Direct	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Please protect from light source.

LIST OF CHEMICAL PATHOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
7	Calcium	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
8	Chloride	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
9	Creatinine	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
10	Glucose	Plasma	Sodium Fluoride tube. Paediatric patient: Sodium Fluoride tube	5 ml (adult), 0.5 ml (paediatric)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
11	Lactate Dehydrogenase (LDH)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.

LIST OF CHEMICAL PATHOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
12	Lipid Profile: a. Total Cholesterol,(TC) b. HDL -Cholesterol c. LDL -Cholesterol d. Triglycerides (TG)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
13	Liver Function Test: a. Total Protein b. Albumin c. Globulin d. Total Bilirubin e. ALP f. ALT	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
14	Magnesium (Mg)	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
15	Phosphate	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.

LIST OF CHEMICAL PATHOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
16	Potassium	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
17	Renal Profile: a. Sodium b. Potassium c. Chloride d. Urea e. Creatinine	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
18	Total Protein	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
19	Total Serum Bilirubin (TSB) a. Total bilirubin b. Direct Bilirubin	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Please protect from light source.
20	Urea	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.

LIST OF CHEMICAL PATHOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
21	Uric Acid	Serum or plasma	Plain tube (serum) or Lithium heparin tube (plasma) Paediatric tube	3-5 ml (adult), 0.5 - 1 ml (paeds)	1 hour (STAT) 6 hours (routine)	Samples should reach the laboratory within two hours of sample collection.
22	Urine Pregnancy Test	Urine	Sterile screw-cap container	10 ml	30 minutes	N/A
23	Stool Occult Blood	Stool	Sterile screw-cap container	3 ml	1 hour(STAT) 6 hours(routine)	N/A

LIST OF HAEMATOLOGY TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
24	Full Blood Count (FBC)	Blood	EDTA	2-3 ml	1 hour (STAT) 4 hours (routine)	N/A
25	Erythrocyte Sedimentation Rate (ESR)	Blood	EDTA	3 ml	1 hour (STAT) 4 hours (routine)	N/A
26	Prothrombin Time (PT)/INR	Blood	Na Citrate	2 ml	1 hour (STAT) 4 hours (routine)	Transport samples within 4 hours at room temperature.
27	Activated Partial Thrombin Time (APTT)	Blood	Na Citrate	2 ml	1 hour (STAT) 4 hours (routine)	Transport samples within 4 hours at room temperature.

LIST OF URINALYSIS TEST

NO	TESTS	TYPE OF SPECIMEN	SPECIMEN CONTAINER	VOLUME OF SPECIMEN	LTAT	REMARK
28	Urine Full Chemistry and Microscopic Examination (UFEME)	Urine	Sterile screw-cap container	10 ml	1 hour (STAT) 4 hours (routine)	Transport samples within 4 hours at room temperature.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
1	Acetaminophen (Paracetamol)	Serum	Plain tube without additive	4 ml blood	Routine	1 hours (STAT)	Enzymatic (Acyl Amidohydrolase) Endpoint on Abbott Alinity ci-series	Analgesic / Anti-pyretic : 10-20 ug/ml Toxicity Cases : Refer Rummack Matthew Nomogram	Available 24 hrs, PER-PAT 301 form/ TDM form (In-house)
2	Alanine Transaminase (ALT)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Enzymatic : NADH (without P-5'-P) on Abbott Alinity ci-series	0-55 U/L	Avoid haemolysis
3	Albumin	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Colorimetric (Bromocresol Purple) on Abbott Alinity ci-series	<u>ADULT</u> : 35 - 50 g/L > 60 years : 34 - 48 g/L <u>PAEDIATRIC</u> 0 - 4 days : 28 - 44 g/L 5 days -14 years : 38 - 54 g/L	
4	Alkaline Phosphatase (ALP)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Para-nitrophenyl Phosphate on Abbott Alinity ci-series	<u>ADULT</u> ≥ 18 YEARS : 40 - 150 U/L <u>PAEDIATRIC</u> 0- <14 days 90 - 273 U/L 15 days - <1 yr 134 - 518 U/L 1 yr - <10 yrs 156 - 369 U/L 10 - <13 yrs 141 - 460 U/L 13 - <15 yrs Male: 127 - 517 U/L 13 - <15 yrs Female: 62 - 280 U/L 15 - <17 yrs Male: 89 - 365 U/L 15 - <17 yrs Female: 54 - 128 U/L 17 - <18 yrs Male: 59 - 164 U/L 17 - <18 yrs Female: 48 - 95 U/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
5	Alpha Feto-Protein (AFP)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	≤8.78 ng/mL	PER-PAT 301 form (specialist's signature required)
6	Amikacin	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<u>NEONATE/ PAEDS /MDD</u> ; Trough : < 5 µg/ml ; Peak : 20 - 40 µg/ml <u>ADULT (MDD)</u> ; Trough : < 10 µg/ml ; Peak : 20 - 40 µg/ml <u>ADULT (SDD)</u> ; Trough : < 2 µg/ml ; Peak : ~40 µg/ml (up to 60 µg/ml) <u>DIALYSIS</u> ; Trough: < 10 µg/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
7	Ammonia	Plasma	EDTA tube	3 ml blood	Routine	1 hours (STAT)	Glutamate Dehydrogenase (enzymatic) on Abbott Alinity ci-series	18 - 72 umol/L	-Lab personnel need to be inform prior for preparation of analysis. -Specimen should be sent immediately with ice. -Sample need to be processed within 30 minutes of collection time. -Do not send through pneumatic tube.
8	Amylase	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Enzymatic Colorimetric according to IFCC on Abbott Alinity ci-series	25 - 125 U/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
9	Amylase, Urine	Random Urine	Urine Container	10 ml	Routine	5 hours	Enzymatic Colorimetric according to IFCC on Abbott Alinity ci-series	No reference range for spot urine	
10	Anti-thyroglobulin (Thyroglobulin Antibody) [Anti-TG]	Serum	Plain tube	4 ml blood	Once a week (Monday)	7 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<4.11 IU/mL	PER-PAT 301 form (specialist's signature required)
11	Anti-thyroid Specific Peroxidase [Anti-TPO]	Serum	Plain tube	4 ml blood	Once a week (Monday)	7 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<5.61 IU/mL	PER-PAT 301 form (specialist's signature required)
12	Aspartate Transaminase (AST)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Enzymatic : NADH (without P-5'-P) on Abbott Alinity ci-series	5 - 34 U/L	
13	Total Beta Human Chorionic Gonadotrophin (β-hCG) (Quantitative)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 day (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	< 5 mIU/mL (Non-pregnant Female)	PER-PAT 301 form (specialist's signature required) Please consult Medical Officer/ Chemical Pathologist for URGENT request.
14	Bilirubin - Direct	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Diazo Reaction on Abbott Alinity ci-series	0.0 - 8.6 umol/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
15	Bilirubin - Indirect	-	-	-	-	-			Calculated parameter
16	Bilirubin - Total	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Diazonium Salt on Abbott Alinity ci-series	> 18 YEARS : 3.4 - 20.5 umol/L <u>PAEDIATRIC</u> 0- < 15 days: 3.3 - 283.8 umol/L 15 days -< 1 year: 0.8 - 11.7 umol/L 1 year - < 9 years: 0.8 - 6.8 umol/L 9 years -< 12 years: 0.8 - 9.4umol/L 12 years - < 15 years: 1.7-11.9 umol/L 15 years - < 18 years: 1.7 - 14.4 umol/L	
17	Biochemistry ; (Fluids for Biochemistry) i) Glucose ii) Total Protein iii) Lactate Dehydrogenase iv) pH	Body Fluids	Plain container / Fluoride tube	3 ml	Routine	5 hours 1 hour (STAT) - [CSF Fluid]		Reference value varies according to fluid samples and should be compared to serum. No established Reference Range for 'Fluids' is available	Send to the laboratory as soon as possible
18	Calcium, Total	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Arsenazo III on Abbott Alinity ci-series	> 18 YEARS : 2.10 - 2.55 mmol/L <u>PAEDIATRIC</u> 0 - < 1 year: 2.13 - 2.74 mmol/L 1 year - < 18 years: 2.29 - 2.63 mmol/L	
19	Calcium, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Arsenazo III on Abbott Alinity ci-series	2.50 - 7.50 mmol/24hrs No reference range for spot urine	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
20	Cancer Antigen 125 (CA125)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	≤ 35.0 U/ml	PER-PAT 301 form (specialist's signature required)
21	Cancer Antigen 19.9 (CA19-9)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	≤ 37.0 U/ml	PER-PAT 301 form (specialist's signature required)

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
22	Carbamazepine	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	4 - 12 µg/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
23	Carcinoembryonic Antigen (CEA)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	≤ 5.00 ng/ml	PER-PAT 301 form (<i>specialist's signature required</i>)
24	Chloride	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	98 - 107 mmol/L	
25	Chloride, CSF	CSF	Fluoride tube / Sterile Bijou bottle	3 ml	Routine	1 hour (STAT)	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	Adult : 118-132 mmol/L	Send to the laboratory as soon as possible
26	Chloride, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	< 1 year: 2 - 10 mmol/24 hrs 1 year - <6 years: 15 - 40 mmol/24 hrs 6 - 10 years: Male 36 - 110 mmol/24hrs Female 18 - 74 mmol/24 hrs 10 - 14 years: Male 64 - 176 mmol/24 hrs Female 36 - 173 mmol/ 24 hrs > 14 years : 110 - 250 mmol/ 24 hrs > 60 years : 95 - 195 mmol/ 24 hrs No reference range for spot urine	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
27	Cholesterol, Total	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Enzymatic on Abbott Alinity ci-series	<5.2 mmol/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
28	Cholinesterase	Serum	Plain tube without additive	4 ml blood	Routine	1 hour (STAT)	DGKC butyrylthiocholine 37oC on Abbott Alinity ci-series	Male : 4389 - 10928 U/L Female : 2879 - 12669 U/L	Available 24 hrs, PER-PAT 301 form
29	Complement C3	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	1-14 years Male 0.80 - 1.70 g/L Female 0.82 - 1.73 g/L >14 - 80 years Male 0.82 - 1.85 g/L Female 0.83 - 1.93 g/L	
30	Complement C4	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	1 - 14 years Male 0.14 - 0.44 g/L Female 0.13 - 0.46 g/L >14 to 80 years Male 0.15 to 0.53 g/L Female 0.15 - 0.57 g/L	
31	Cortisol, Serum	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 day (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	AM cortisol : 102.1 - 535.2 nmol/L PM cortisol : 80.0 - 477.3 nmol/L	PER-PAT 301 form (<i>specialist's signature required</i>) Please consult Medical Officer/ Chemical Pathologist for URGENT request. .
32	C-Reactive Protein (CRP)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	< 5 mg/L	
33	Creatine Kinase, Total (CK)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	NAC (N-acetyl-L-cysteine) on Abbott Alinity ci-series	Male : 30 - 200 U/L Female : 29 -168 U/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
34	Creatinine	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hours (STAT)	Enzymatic on Abbott Alinity ci-series	<p>ADULT Male > 18 YEARS : 64 - 104 umol/L Female > 18 YEARS : 49 - 90 umol/L</p> <p>PAEDIATRIC 0 - < 15 days: 29 - 82 umol/L 15 days - < 2 years: 9 - 32 umol/L 2 years - < 5 years: 18 - 38 umol/L 5 years - < 12 years: 27 - 54 umol/L 12 years - < 15 years: 40 - 72 umol/L</p> <p>15 years - < 18 years: Male 55 - 96 umol/L Female 43 - 74 umol/L</p>	
35	Creatinine Clearance i) Serum/Plasma Creatinine ii) Urine Creatinine	Blood (Plasma / Serum) & Urine	24 hrs urine container & Lithium Heparin tube / Plain tube	4 ml (blood) & 24 hrs Urine collection	Daily	5 hours	Enzymatic on Abbott Alinity ci-series	<p>ADULT Male : 61 - 147 ml/min/1.73 m2 BSA Female : 59 - 151 ml/min/1.73 m2 BSA</p>	The test requires a 24-hour urine collection and a blood sample drawn within 24 hour of urine collection.
36	Creatinine Peritoneal Dialysate	Fluid	Sterile container	3 ml	Routine	5 hours	Enzymatic on Abbott Alinity ci-series	<p>Reference value varies according to fluid samples and should be compared to serum.</p> <p>No established Reference Range for 'Fluids' is available</p>	
37	Creatinine, Urine	Random Urine/ 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Enzymatic on Abbott Alinity ci-series	<p>ADULT (Random Urine) Male 5.1 - 14.2 mmol/L Female 3.9 - 9.4 mmol/L</p> <p>24 hr excretion ADULT Male 7.7 - 21.3 mmol/ 24 hours Female 5.9 - 14.1 mmol/ 24 hours</p>	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
38	CSF Biochemistry i) Glucose ii) Total Protein iii) Chloride iv) Appearance	CSF	Fluoride tube / Sterile Bijou bottle	3 ml	Routine	1 hour (STAT)	Refer individual analyte	Refer individual analyte	Send to the laboratory as soon as possible

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
39	Cyclosporine	Whole Blood	EDTA tube	3 ml blood	Daily (office hours)	5 hours	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p><u>1 MONTH POST TRANSPLANT :</u> C0 : 150 - 350 ng/ml (based on rejection risk) C2 : 1700 ng/ml</p> <p><u>2 MONTHS POST TRANSPLANT:</u> C0 : 150 - 350 ng/ml (based on rejection risk) C2 : 1500 ng/ml</p> <p><u>3 MONTHS POST TRANSPLANT</u> C0 : 150 - 350 ng/ml (based on rejection risk) C2 : 1300 ng/ml</p> <p><u>4 - 6 MONTHS POST TRANSPLANT</u> C0 : 150 - 350 ng/ml (based on rejection risk) C2 : 900 - 1000 ng/ml</p> <p><u>7 - 12 MONTHS POST TRANSPLANT</u> C0 : 100 - 250 ng/ml (based on rejection risk) C2 : 700 - 900 ng/ml</p> <p><u>> 12 MONTHS POST TRANSPLANT :</u> C0 : 50 - 200 ng/ml (based on rejection risk) C2 : 700 - 800 ng/ml</p> <p><u>EVANS SYNDROME :</u> 200 - 250 ng/ml</p> <p><u>BONE MARROW TRANSPLANT:</u> PAEDS: 100 -250 ng/ml ; ADULT: 250-500 ng/ml</p> <p><u>MYASTHENIA GRAVIS :</u> 100-200 ng/ml</p> <p><u>GENERAL FOR BLOOD DISORDER :</u> 70-250 ng/ml</p> <p><u>NEPHROTIC SYNDROME :</u> 50 - 120 ng/ml <u>RHEUMATOID ARTHRITIS :</u> 75-150 ng/ml <u>SLE :</u> 80 - 150 ng/ml <u>PSORIASIS VULGARIS,ITP :</u> 100 - 200 ng/ml <u>APLASTIC ANEMIA :</u> 75-200 ng/ml <u>MYELOYDYSPLASTIC SYNDROME:</u> 200-400 ng/ml <u>GRAFT VERSUS HOST DISEASE:</u> 200-600 ng/ml</p>	TDM form Please consult Chemical Pathologist for URGENT request after office hours.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
40	Digoxin	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<u>Congestive Cardiac Failure (CCF) / CHF:</u> 0.5 - 0.9 ng/ml <u>Atrial Fibrillation:</u> 0.8 - 2 ng/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
41	Estimated Glomerular Filtration Rate (eGFR)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours		eGFR <60 ml/min/1.73m ³ for >3 months defines CKD >90 ml/min/1.73m ³ : Stage 1 (Normal/high) 60-89 ml/min/1.73m ³ : Stage 2 (Mildly decreased) 45-59 ml/min/1.73m ³ : Stage 3A (Mildly to moderately decreased) 30-44 ml/min/1.73m ³ : Stage 3B (Moderately to severely decreased) 15-29 ml/min/1.73m ³ : Stage 4 (Severely decreased) <15 ml/min/1.73m ³ : Stage 5 (Kidney failure)	eGFR is auto calculated when creatinine is requested. Please take note eGFR calculation is based on CKD-EPI 2022 thus not valid for ages < 18 years old and pregnant lady.
42	Estradiol (Oestradiol/E2)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<u>Female</u> Follicular phase : 77 - 921 pmol/L Mid-cycle phase : 140 - 2382 pmol/L Luteal phase : 77- 1145 pmol/L Post-menopausal Not on HRT <37 - 103 pmol/L On HRT <37 - 529 pmol/L <u>Male</u> 40 - 161 pmol/L	Blood taking at Day 2 to Day 5 menses is preferable
43	Lipid Profile i) Cholesterol, Total ii) HDL Cholesterol iii) LDL Cholesterol iv) Triglycerides v) Non-HDL Cholesterol	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours		Refer individual analyte and range from Malaysian CPG for Management of Dyslipidaemia, 2017	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
44	Ferritin	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 day (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	Male : 21.81 - 274.66 ug/L Female : 4.63 - 204.00 ug/L	PER-PAT 301 form (<i>specialist's signature required</i>) Please consult Medical Officer/ Chemical Pathologist for URGENT request. .
45	Folate	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	7.0 - 46.4 nmol/L	PER-PAT 301 form (<i>specialist's signature required</i>)
46	Follicle Stimulating Hormone (FSH)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<u>Male</u> 0.95 - 11.95 IU/L <u>Female</u> Follicular phase 3.03 - 8.08 IU/L Midcycle peak 2.55 - 16.69 IU/L Luteal phase 1.38 - 5.47 IU/L Post menopausal 26.72 - 133.41 IU/L	Blood taking at Day 2 to Day 5 menses is preferable
47	Free Thyroxine (FT4)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 day (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<u>ADULT</u> : 9.01 - 19.05 pmol/L <u>PAEDIATRIC</u> 5d -<15d 13.5 - 41.3 pmol/L 15d -<30d 8.7 - 32.5 pmol/L 30d -<1 yr 11.4 - 21.9 pmol/L 1yr -<19 yrs 11.4 - 17.6 pmol/L	PER-PAT 301 form (<i>specialist's signature required</i>) Please consult Medical Officer/ Chemical Pathologist for URGENT request.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
48	Free Triiodothyronine (FT3)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 day (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series L-	<p><u>ADULT</u> : 2.89 -4.88 pmol/L</p> <p><u>PAEDIATRIC</u> 4d - <1 yr 3.56 -7.48 pmol/L 1yr - <12 yrs 4.29 -6.79 pmol/L</p> <p>12 - <15yrs Female 3.84 - 6.06 pmol/L Male 4.44 - 6.65 pmol/L</p> <p>15 - <19 yrs Female 3.55 - 5.70 pmol/L Male 3.46 -5.92 pmol/L</p>	<p>PER-PAT 301 form (<i>specialist's signature required</i>)</p> <p>Please consult Medical Officer/ Chemical Pathologist for URGENT request.</p>
49	Gamma-glutamyltransferase (GGT)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	M-Gamma-glutamyl-3-carboxy-4-nirtoanilide Substrate on Abbott Alinity ci-series	<p>Male : 12 - 64 U/L Female : 9 - 36 U/L</p>	
50	Gentamicin	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<p><u>NEONATE/ PAEDS:</u> Trough : < 1 µg/ml; Peak : 5 - 12 µg/ml</p> <p><u>ADULT (MDD):</u> Trough : < 2 µg/ml ; Peak : 5 - 10 µg/ml</p> <p><u>ADULT (SDD):</u> Trough : < 1 µg/ml ; Peak : 10-30 µg/ml</p> <p><u>SYNERGISTIC:</u> Trough : < 1 µg/ml ; Peak : 3 - 4 µg/ml (conventional dosing against Gram positive organism)</p> <p><u>DIALYSIS:</u> Trough: < 2 µg/ml</p>	<p>TDM form</p> <p>Please consult Chemical Pathologist for URGENT request after office hours.</p>

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
51	Glucose (RBS, FBS, 2HPP)	Plasma	Fluoride tube	3 ml blood	Routine	5 hours 1 hour (STAT)	Enzymatic, hexokinase / G-6 PDH on Abbott Alinity ci-series	<u>RANDOM</u> Normal : < 7.8 mmol/L Diabetic : > 11.1 mmol/L <u>FASTING</u> Normal : < 6.1 mmol/L IFG : 6.1 - 6.9 mmol/L Diabetic : ≥ 7.0 mmol/L <u>2 HPP</u> Normal : < 7.8 mmol/L IGT : 7.8 - 11.0 mmol/L Diabetic : ≥ 11.1 mmol/L	For Fasting Blood Sugar - Blood sample for this test is taken after an 8-12 hours or overnight fasting. Water intake (plain water) is allowed during this fasting period
52	Glucose, CSF	CSF	Fluoride tube / Sterile Bijou bottle	3 ml	Routine	1 hour (STAT)	Enzymatic, hexokinase / G-6 PDH on Abbott Alinity ci-series	Adult: 2.2 - 3.9 mmol/L Infant/child: 3.3 - 4.5 mmol/L	Send to the laboratory as soon as possible
53	Glucose Peritoneal Dialysate	Fluid	Fluoride tube	3 ml	Routine	5 hours	Enzymatic, hexokinase / G-6 PDH on Abbott Alinity ci-series	Reference value varies according to fluid samples and should be compared to serum. No established Reference Range for 'Fluids' is available	
54	Haemoglobin A1c (HbA1c)	Whole Blood	EDTA tube	3 ml blood	Daily (office hours)	3 days	High Performance Liquid Chromathography (HPLC) on Bio-rad D10	NORMAL : NGSP (< 5.7 %) Pre-DIABETIC : NGSP (5.7 % - < 6.3 %) DIABETIC : NGSP (> 6.3 %)	Rejection criteria : Request less than 3 months (12 weeks) from previous result.
55	HDL Cholesterol	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Accelerator Selective Detergent on Abbott Alinity ci-series	Male : >1.0 mmol/L Female : >1.2 mmol/L	Reference range adopted from Malaysian CPG for Management of Dyslipidaemia, 2023

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
56	Immunoglobulin A (IgA)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	<u>0 - 3 months</u> Male 0.01 - 0.34 g/L Female 0.01 - 0.34 g/L <u>>3 months - 1 year</u> Male 0.08 - 0.91 g/L Female 0.08 - 0.91 g/L <u>>1 - 12 years</u> Male 0.21 - 2.91 g/L Female 0.21 - 2.82 g/L <u>>12- 60 years</u> Male 0.63 - 4.84 g/L Female 0.65 - 4.21 g/L <u>>60 years</u> Male 1.01 - 6.45 g/L Female 0.69 - 5.17 g/L	
57	Immunoglobulin G (IgG)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	<u>0 - 1 month</u> Male 3.97 - 17.65 g/L Female 3.91 -17.37 g/L <u>>1 month - 1 year</u> Male 2.05 - 9.48 Female 2.03 - 9.34 g/L <u>>1- 2 years</u> Male 4.75 - 12.10 g/L Female 4.83 - 12.26 g/L <u>>2 -80 years</u> Male 5.40 - 18.22 Female 5.52 - 16.31 g/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
58	Immunoglobulin M (IgM)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunturbidimetric on Abbott Alinity ci-series	<u>Newborn</u> 0.06 - 0.21 g/L <u>3 months to 1 year</u> Male 0.17 - 1.43 Female 0.17 - 1.50 g/L <u>>1 to 12 years</u> Male 0.41 - 1.83 g/L Female 0.47 - 2.40 g/L <u>>12 years</u> Male 0.22 - 2.40 Female 0.33 - 2.93 g/L	
59	Iron (Fe), Total	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Ferene (colorimetric) on Abbott Alinity ci-series	Male : 11.6 - 31.3 umol/L Female : 9.0 - 30.4 umol/L	
60	Iron Binding Capacity (TIBC)	-	-	-	-	-			Calculated parameter
61	Lactate	Plasma	Fluoride tube	3 ml blood	Routine	1 hours (STAT)	Lactic Acid to Pyruvate on Abbott Alinity ci-series	0.5 - 2.2 mmol/L	-Specimen should be sent immediately in ice bath. -Sample need to be processed within 15 minutes of collection time.
62	Lactate, CSF	CSF	Fluoride tube	3 ml	Routine	1 hours (STAT)	Lactic Acid to Pyruvate on Abbott Alinity ci-series		-Send to the laboratory as soon as possible. -Specimen should be sent immediately in ice bath. -Sample need to be processed within 15 minutes of collection time.

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
63	Lactate Dehydrogenase (LDH)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	IFCC recommended forward reaction - Lactate to Pyruvate on Abbott Alinity ci-series	<p>≥ 18 YEARS : 125 - 220 U/L</p> <p><u>PAEDIATRIC</u> 0 - <15 days: 309 - 1222 U/L 15 days - < 1 year: 163 - 452 U/L 1 year - < 10 years: 192 - 321 U/L</p> <p>10 years - < 15 years: Male : 170 - 283 U/L Female : 157 - 272 U/L</p> <p>15 years - < 18 years : 130 - 250 U/L</p>	
64	LDL Cholesterol	-	-	-	-	-		<p>Target for LDL-C level is based on Cardiovascular (CV) risk Low CV Risk : < 3.0 mmol/L Mod CV Risk : < 2.6 mmol/L High CV Risk : ≤ 1.8 mmol/L and a reduction of > 50% from baseline Very High CV Risk : ≤ 1.4 mmol/L and a reduction of > 50% from baseline. Those with recurrent CV event within 2 years despite achieving LDL-C < 1.4 mmol/L : < 1 mmol/L</p>	<p>Calculated parameter</p> <p>Reference range adopted from Malaysian CPG for Management of Dyslipidaemia, 2023</p>
65	<p><u>Liver Function Test (LFT)</u> i) Total Protein ii) Albumin iii) Total Bilirubin iv) Alkaline Phosphatase v) Alanine Transaminase</p>	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours		Refer individual analyte	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
66	Luteinising Hormone (LH)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p><u>Males</u> 0.57 - 12.07 IU/L</p> <p><u>Females</u> Follicular phase 1.80 -11.78 IU/L Midcycle peak 7.59 - 89.08 IU/L Luteal phase 0.56 - 14.00 IU/L Postmenopausal 5.16 - 61.99 IU/L</p>	Blood taking at Day 2 to Day 5 menses is preferable
67	Magnesium	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hours (STAT)	Enzymatic on Abbott Alinity ci-series	<p><u>> 18 YEARS</u> : 0.66 - 1.07 mmol/L</p> <p><u>PAEDIATRIC</u> 0 - < 15 days: 0.82 - 1.62 mmol/L 15 days - < 1 year: 0.81 - 1.27 mmol/L 1 year - < 18 years: 0.86 - 1.17 mmol/L</p>	
68	Magnesium, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Enzymatic on Abbott Alinity ci-series	<p>3.00 - 5.00 mmol/24 hrs</p> <p>No reference range for spot urine</p>	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
69	Methotrexate	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p>0 - 24 Hours : ≤ 5 µmol/L 25 - 48 Hours : ≤ 0.5 µmol/L 49 - 72 Hours : ≤ 0.05 µmol/L > 72 Hours : ≤ 0.05 µmol/L</p>	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
70	Microalbumin (Quantitative), Urine	Urine	Urine container	10 ml	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	<p><u>Categories of Albuminuria:</u> <u>ACR (mg/mmol)</u> <3 : A1 (normal to mildly increased) 3 - 30 : A2 (moderately increased) >30 : A3 (severely increased)</p> <p><u>24 hour albumin excretion rate (AER) (mg/24 hours)</u> < 30 : A1 (normal to mildly increased) 30 - 300: A2 (moderately increased) > 300: A3 (severely increased)</p> <p>No reference range for spot urine</p>	First voided urine (preferred). Random urine is acceptable if a first-morning urine is not available

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
71	Non-HDL Cholesterol	-	-	-	-	-		Target for non HDL-C level is based on Cardiovascular (CV) risk Low CV Risk : < 3.8 mmol/L Mod CV Risk : < 3.4 mmol/L High CV Risk : ≤ 2.6 mmol/L and a reduction of > 50% from baseline Very High CV Risk : ≤ 2.2 mmol/L and a reduction of > 50% from baseline	Calculated parameter Reference range adopted from Malaysian CPG for Management of Dyslipidaemia, 2023
72	Occult Blood (Qualitative)	Stool	Stool container	1 gram	Routine	5 hours	Immunochemical	Negative	
73	Osmolality, Serum	Serum	Plain tube	4 ml blood	Routine	5 hours	Freezing Point Depression on Advanced Instrument Osmometer	Adults : 275-295 mOsm/kg	
74	Osmolality, Urine	Urine	Urine container	10 ml	Routine	5 hours	Freezing Point Depression on Advanced Instrument Osmometer	Adults : 300-900 mOsm/kg	
75	Paraquat, Urine	Urine	Urine container	10 ml	Routine	1 hour (STAT)	Manual Method (Sodium Dithionite)	Detected if present	Available 24 hrs, PER-PAT 301 form
76	Phenobarbital	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<u>EPILEPSY</u> : 10 - 40 µg/ml <u>REFRACTORY STATUS EPILEPTICUS</u> : > 70 µg/ml (up to 100 µg/ml)	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
77	Phenytoin	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Enzyme Immunoassay on Abbott Alinity ci-series	<u>Neonate</u> : 8 - 15 µg/ml <u>Adult</u> : 10 - 20 µg/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
78	Phosphate	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Phosphomolybdate on Abbott Alinity ci-series	<p>≥ 18 YEARS : 0.74 - 1.52 mmol/L</p> <p><u>PAEDIATRIC</u> 0 - < 15 days: 1.8 - 3.4 mmol/L 15 days - < 1year: 1.54 - 2.72 mmol/L 1 year - < 5 years: 1.38 - 2.19 mmol/L 5 year - < 13 years: 1.33 - 1.92 mmol/L</p> <p>13 years - < 16 years: mmol/L Male 1.14 - 1.99 mmol/L Female 1.02 - 1.79 mmol/L</p> <p>16 years - < 18 years: 0.95 - 1.62 mmol/L</p>	
79	Phosphate , Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Phosphomolybdate on Abbott Alinity ci-series	<p>12.9 - 42.0 mmol/24 hrs</p> <p>No reference range for spot urine</p>	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
80	Potassium	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hours (STAT)	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	3.5 - 5.1 mmol/L	
81	Potassium, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	<p><u>6 - 10 years:</u> Male 17 - 54 mmol/24 hrs Female 8 - 37 mmol/24 hrs</p> <p><u>10 - 14 years:</u> Male 22 - 57 mmol/24 hrs Female 18 - 58 mmol/24 hrs</p> <p><u>Adult:</u> 25 - 125 mmol/24 hrs</p> <p>No reference range for spot urine</p>	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
82	Progesterone	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<u>Female</u> Luteal phase 3.816 - 50.562 nmol/L <u>Male</u> <0.318 - 0.636 nmol/L	Blood taking at Day 21 of menses
83	Prolactin	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	Male : 72.66 - 407.40 mIU/L Female : 108.78 -557.13 mIU/L	PER-PAT 301 form (<i>specialist's signature required</i>)
84	Prostate Specific Antigen, Total (TPSA)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	0 - 4.0 ug/L	PER-PAT 301 form (<i>specialist's signature required</i>)
85	Protein, CSF	CSF	Sterile Bijou bottle	3 ml	Routine	1 hours (STAT)	Turbidimetric (Benzthonium Chloride) on Abbott Alinity ci-series	0.15 - 0.40 g/L	Send to the laboratory as soon as possible
86	Protein, Total	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Biuret on Abbott Alinity ci-series	<u>> 18 YEARS</u> : 64 - 83 g/L <u>PAEDIATRIC</u> 0 - < 15 days: 53 - 83 g/L 15 days - < 1 year: 44 - 71 g/L 1 year - < 6 years: 61 - 75 g/L 6 years - < 9 years: 64 - 77 g/L 9 years - < 18 years: 65 - 81 g/L	

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
87	Protein, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Turbidimetric (Benzthionium Chloride) on Abbott Alinity ci-series	<p><u>RANDOM</u> : 0.01 -0.14 g/L</p> <p><u>24 hour excretion</u> < 0.15 g/ 24 hours : A1 (normal to mildly increased) 0.15 - 0.5 g/24 hours : A2 (moderately increased) > 0.5 g/24 hours : A3 (severely increased)</p> <p><u>Urine PCR</u> < 15 mg/mmol: A1 (normal to mildly increased) 15 - 50 mg/mmol : A2 (moderately increased) > 50 mg/mmol : A3 (severely increased)</p>	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
88	Reducing Sugar, Urine	Random Urine	Urine container	10 ml	Daily (office hours)	5 hours	Qualitative Method (Copper Sulphate Tablet in NaOH)	Negative	Test offer for in-house patient ONLY
89	Renal Profile i) Urea ii) Creatinine iii) Chloride iv) Potassium v) Sodium	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Refer individual analyte	Refer individual analyte	
90	Rheumatoid Factor	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Immunoturbidimetric on Abbott Alinity ci-series	< 30 IU/ml	
91	Salicylate	Serum	Plain tube without additive	4 ml blood	Routine	1 hours (STAT)	Enzymatic / Colorimetric on Abbott Alinity ci-series	<p><u>Anti-inflammatory</u> : 150 - 300 µg/ml <u>Rheumatic fever</u> : 250 - 400 µg/ml <u>Toxicity case</u> : > 200 µg/ml</p>	TDM form Please consult Chemical Pathologist for URGENT request after office hours.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
92	Serum-Ascitic Albumin Gradient (SAAG) i) Serum/Plasma Albumin ii) Fluid Albumin	Serum / Plasma & Fluid	Plain tube / Heparinised tube / Sterile Fluid Container	4 ml blood & 3 ml Fluid	Routine	5 hours	Colorimetric (Bromocresol Purple) on Abbott Alinity ci-series	<u>Gradient</u> : Transudate : > 11g/L Exudate : ≤ 11g/L	Send both serum / plasma and fluid specimen that are taken on the same day for the SAAG determination.
93	Sodium	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hours (STAT)	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	136 - 145 mmol/L	
94	Sodium, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Ion Selective Electrode Diluted (indirect) on Abbott Alinity ci-series	<u>6-10 years:</u> Male 41 - 115 mmol/24 hrs Female 20 - 69 mmol/24hrs <u>>10- 14 years:</u> Male 63 - 177 mmol/24hrs Female 48 - 168 mmol/24hrs <u>Adult:</u> Male 40 - 220 mmol/24hrs Female 27 - 287 mmol/24hrs No reference range for spot urine	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
95	Tacrolimus	Whole Blood	EDTA tube	3 ml blood	Daily (office hours)	5 hours	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<u>0 - 6 MONTHS POST TRANSPLANT</u> : 6 - 15 ng/ml (based on rejection risk) <u>7 - 12 MONTHS POST TRANSPLANT</u> : 5 - 12 ng/ml (based on rejection risk) <u>> 12 MONTHS POST TRANSPLANT</u> : 4 - 12 ng/ml (based on rejection risk)	TDM form Please consult Chemical Pathologist for URGENT request after office hours.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
96	Testosterone	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p><u>Male</u> 21 - 49 yrs 8.33 - 30.19 nmol/L >49 years 7.66-24.82 nmol/L</p> <p><u>Female</u> 21 - 49 years 0.48 - 1.85 nmol/L >49 years 0.43 - 1.24 nmol/L</p>	
97	Theophylline	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Enzyme Immunoassay on Abbott Alinity ci-series	<p><u>APNOEA/ BRADYCARDIA IN NEONATE</u> : 5 - 10 µg/ml</p> <p><u>ASTHMA/ COAD</u> : 10 - 20 µg/ml</p>	<p>TDM form</p> <p>Please consult Chemical Pathologist for URGENT request after office hours.</p>
98	Thyroid Stimulating Hormone (TSH)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days 1 days (URGENT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p><u>ADULT</u> : 0.35 - 4.94 mIU/L</p> <p><u>PAEDIATRIC</u> 4d - <6m 0.73 - 4.77 mIU/L 6m - <14yrs 0.70 - 4.17 mIU/L 14 - <19 yrs 0.47 - 3.41 mIU/L</p> <p><u>Cord TSH</u> < 20 mIU/L (Normal) 20 - 60 mIU/L (Borderline) > 60 mIU/L (High)</p>	<p>PER-PAT 301 form (<i>specialist's signature required</i>)</p> <p>Please consult Medical Officer/ Chemical Pathologist for URGENT request.</p>
99	Thyroglobulin	Serum	Plain tube	4 ml blood	Once a week (Monday)	7 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	3.68 - 97.5 ng/mL	PER-PAT 301 form (<i>specialist's signature required</i>)
100	Transferrin Saturation	-	-	-	-	-	-	16%-45%	Calculated parameter
101	Triglycerides	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Glycerol Phosphate Oxidase on Abbott Alinity ci-series	< 1.7 mmol/L	Reference range adopted from Malaysian CPG for Management of Dyslipidaemia, 2023
102	Troponin I High Sensitive (hs-Trop I)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	1 hour (STAT)	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	<p><u>99th percentile Troponin Cut-off Value (URL)</u> Female : ≤ 15.6 ng/L Male : ≤ 34.2 ng/L</p>	PER-PAT 301 form (<i>specialist's signature required</i>)

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
103	Unsaturated Iron Binding Capacity (UIBC)	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Ferene (colorimetric) on Abbott Alinity ci-series	Male : 12.4 - 43.0 umol/L Female : 12.5 - 55.5 umol/L	
104	Urea	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours 1 hour (STAT)	Urease on Abbott Alinity ci-series	<u>PAEDIATRIC</u> 1- 3 years 1.8 - 6.0 mmol/L 4 - 13 years 2.5 - 6.0 mmol/L 14 - 19 years 3.0 - 7.5 mmol/L <u>Adult, Male</u> <50 years 3.2 - 7.4 mmol/L >50 years 3.0 - 9.2 mmol/L <u>Adult, Female</u> <50 years 2.5 - 6.7 mmol/L >50 years 3.5 - 7.2 mmol/L	
105	Urea, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Urease on Abbott Alinity ci-series	428 - 714 mmol/24 hrs No reference range for spot urine	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group
106	Uric Acid	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Routine	5 hours	Uricase on Abbott Alinity ci-series	Male : 210 - 420 umol/L Female : 150 - 350 umol/L	
107	Uric Acid, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	10 ml / 24 hrs Urine Collection	Routine	5 hours	Uricase on Abbott Alinity ci-series	1.48 - 4.43 mmol/24 hrs No reference range for spot urine	Volume 24 hr urine must be > 500 ml; EXCEPTIONAL for ESRD patient and Paediatric Group

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
108	Urine Albumin Creatinine Ratio (ACR) i) Urine Albumin ii) Urine Creatinine	Urine	Urine container	10 ml	Routine	5 hours	Refer individual analyte	<u>Urine ACR (mg/mmol)</u> <3 : A1 (normal to mildly increased) 3 - 30 : A2 (moderately increased) >30 : A3 (severely increased)	First voided urine (preferred). Random urine is acceptable if a first-morning urine is not available Calculated value. (Please refer Laboratory Investigation Guidelines for CKD and utilization of eGFR in Adults)

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
109	Urine Biochemistry & Microscopic Examination (Urine FEME - Urinalysis)	Urine	Urine container	10 ml	Routine	5 hours	Automated Cell Analyser (IRIS) - iRICELL	<p><u>Urine Biochemistry (Qualitative)</u> Colour : Colorless, Straw Clarity : Clear Blood : Negative Bilirubin : Negative Urobilinogen : Normal Ketone : Negative Protein : Negative Nitrite : Negative Glucose : Negative pH : 5.0-8.0 Specific Gravity : 1.000-1.030 Leukocytes : Negative</p> <p><u>Urine Microscopy</u> White Blood Cells : 0-33 / ul Red Blood Cells : 0-16 / ul Bacteria : Not Detected /HPF Budding Yeast : Not Detected graded / ul Hyphae Yeast : 0-11 / ul Squamous Epithelial : 0-33 / ul Sperm : 0-5 / ul Hyaline Cast : 0-1 / ul WBC Cast : 0-5 / ul Epithelial Cast : 0-5 / ul RBC Cast : 0-5 / ul Granular Cast : 0-5 / ul Cellular Cast : 0-5 / ul</p>	<p>Send to the laboratory as soon as possible.</p> <p>Specimen need to be processed within 4 hours of collection time.</p>
110	Urine Protein Creatinine Ratio (PCI - Protein Creatinine Index) i) Protein, Urine ii) Creatinine, Urine	Urine	Urine container	10 ml	Routine	5 hours	Refer individual analyte	<p><u>Urine PCR</u> < 15 mg/mmol: A1 (normal to mildly increased) 15 - 50 mg/mmol : A2 (moderately increased) > 50 mg/mmol : A3 (severely increased)</p>	Calculated value.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REFERENCE RANGE	REMARK
111	Urine Pregnancy Test (UPT), Qualitative	Urine	Urine container	10 ml	Routine	5 hours	Immunochromatography	Positive or Negative	Fresh voided urine (preferred)
112	Valproic Acid	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<u>EPILEPSY</u> : 50- 100 µg/ml <u>PSYCHIATRIC DISORDER</u> : 50- 125 µg/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours.
113	Vancomycin	Plasma / Serum	Lithium Heparin tube / Plain tube without additive	4 ml blood	Daily (office hours)	5 hours	Homogenous Particle Enhanced Turbidimetric Inhibition Immunoassay (PETINIA) on Abbott Alinity ci-series	<u>NON- COMPLICATED INFECTION</u> Trough : 10 - 15 µg/ml ; Peak : 25 - 40 µg/ml <u>COMPLICATED INFECTION</u> Trough : 15 - 20 µg/ml ; Peak : 25 - 40 µg/ml <u>CONTINUOUS INFUSION</u> : 15 - 25 µg/ml <u>CONTINUOUS INFUSION (SERIOUSLY ILL)</u> : 20-25 µg/ml <u>DIALYSIS (NON COMPLICATED INFECTION)</u> : 10 - 15 µg/ml <u>DIALYSIS (COMPLICATED INFECTION)</u> : 15 -20 µg/ml <u>AUC24/MIC</u> : 400-600 µg.hr/ml	TDM form Please consult Chemical Pathologist for URGENT request after office hours
114	Vitamin B12	Plasma / Serum	Lithium Heparin tube / Plain tube	4 ml blood	Daily (office hours)	3 days	Chemiluminescent Microparticle Immunoassay (CMIA) on Abbott Alinity ci-series	138 - 652 pmol/L	PER-PAT 301 form (specialist's signature required)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REMARK
Amphetamine Type Stimulants (ATS), Cannabinoids (THC) and Opiates (Morphine & Codeine) - SCREENING								
115	ATS, THC and Morpheine & Codeine (Screening)	Urine	Urine container	30 ml	Daily (office hours)	7 days	Immunoassay	Medicolegal Cases - Borang Permintaan Ujian Pengesanan Dadah Dalam Air Kencing UPD-1 (Pindaan 2020) with Chain of Custody (COC) Clinical Cases - Borang PER-PAT 301 with Chain of Custody (COC)
Amphetamine Type Stimulants (ATS) - CONFIRMATORY								
116	Amphetamine	Urine	Urine container	30 ml	Daily (office hours)	Medicolegal Cases (60 days) URGENT Medicolegal Cases (14 days) Clinical Cases (14 days) (80% of result must achieve LTAT)	Gas Chromatography - Mass Spectrometry (GCMS)	Medicolegal Cases - Borang Permintaan Ujian Pengesanan Dadah Dalam Air Kencing UPD-1 (Pindaan 2020) with Chain of Custody (COC) Clinical Cases - Borang PER-PAT 301 with Chain of Custody (COC)
117	Methamphetamine							
118	Methylenedioxyamphetamine (MDA)							
119	3,4 Methylenedioxy methamphetamine (MDMA)							

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	TEST SCHEDULE	LAB TAT	METHODOLOGY	REMARK
Cannabinoids (THC) - CONFIRMATORY								
120	Delta-9-THC-COOH	Urine	Urine container	30 ml	Daily (office hours)	10 days (80% of result must achieve LTAT)	Thin Layer Chromatography (TLC)	Medicolegal Cases - Borang Permintaan Ujian Pengesanan Dadah Dalam Air Kencing UPD-1 (Pindaan 2020) with Chain of Custody (COC) Clinical Cases - Borang PER-PAT 301 with Chain of Custody (COC)
Opiates - CONFIRMATORY								
121	Morphine	Urine	Urine container	30 ml	Daily (office hours)	10 days (80% of result must achieve LTAT)	Thin Layer Chromatography (TLC)	Medicolegal Cases - Borang Permintaan Ujian Pengesanan Dadah Dalam Air Kencing UPD-1 (Pindaan 2020) with Chain of Custody (COC) Clinical Cases - Borang PER-PAT 301 with Chain of Custody (COC)
122	Codeine							

IMPORTANT NOTES

1. The Referral Laboratory Turn Around Time (*RLTAT*) stated in this handbook refers to the Turn Around Time (*TAT*) claimed by the Referral Laboratory. This does not include specimen handling and transportation as well as time taken for the reports to be received by the respective laboratories in the HSAJB Pathology Department.
2. Every Test request to referred lab must include 2 copies of test request forms unless specified otherwise. **Specialist's SIGNATURE** and stamp is **COMPULSORY**.
3. Use PER-PAT 301 request form unless specified otherwise. (*Refer REMARK column*)
4. Day of Despatch : **MONDAY** and **WEDNESDAY** (*Working Days*) unless specified otherwise.
5. If required test(s) are **NOT LISTED** in the table below, please contact relevant laboratory (**Ext : 2630**)

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL AMPANG

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Beta-2 Microglobulin	Serum	Plain tube	3 ml blood	15 working days	
2	CSF Oligoclonal Band	CSF & Serum	Sterile Bijou bottle / Plain tube	3 ml (CSF) and 5 ml (Serum)	30 working days	-It is recommended to collect both CSF and serum specimen at same time. -CSF specimen MUST be accompanied with serum specimen together.
3	Free Light Chain Quantitation (SFLC)	Serum	Plain tube	3 ml blood	15 working days	
4	Fructosamine	Plasma / Serum	Lithium Heparin tube / Plain tube	3 ml blood	15 working days	
5	Myoglobin	Urine	24 hrs urine container without preservative	5 ml	15 working days	
6	Alpha antrypsin phenotyping	Serum	Plain tube	3 ml blood	30 working days	

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Chemical Pathology/Clinical Toxicology Laboratory

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Adenocorticotrophic Hormone (ACTH)	Whole Blood	EDTA tube	2 ml blood	15 days	-Put in ice once blood drawn and send to the lab immediately. -Use cold centrifuge to separate the plasma. -Keep in freezer -20°C and send to the referral lab in ice packs. -Schedule Analysis : Once in a week
2	Alpha-1-Antitrypsin	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
3	Anti-thyroid Stimulating Hormone Receptor	Serum	Plain tube	5 ml blood	15 days	Schedule Analysis : Twice a week
4	Caeruloplasmin	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
5	Cancer Antigen 15-3	Serum	Plain tube	3 ml blood	15 days	
6	C-Peptide	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
7	Dehydroepiandrosterone Sulfate (DHEA-S)	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
8	Ethanol	Serum	Plain tube	4 ml blood	10 days	Schedule Analysis Weekdays: Office hours Saturday: 8:30 am -1:30 pm Sunday & PH: Appointment TDM form

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Chemical Pathology/Clinical Toxicology Laboratory

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
9	Everolimus	Whole Blood	EDTA tube	2 ml blood	8 days	Schedule Analysis : Tuesday and Friday TDM form
10	Haptoglobin	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
11	Insulin	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week
12	Mycophenolic Acid	Whole Blood	EDTA tube	2 ml blood	10 days	Schedule Analysis : Once in a week (Friday) TDM form
13	Parathyroid Hormone, Intact (iPTH 1-84)	Serum	EDTA tube	3 ml blood	12 days	Keep the specimen frozen or within 2-8oC during transportation Schedule Analysis : Twice a week
14	Prostate Specific Antigen (Free)	Serum	Plain tube	3 ml blood	12 days	
15	Protein Electrophoresis, Serum	Serum	Plain tube	3 ml blood	20 days	Blood and urine sample must be sent together. Schedule Analysis : Once in a week
16	Protein Electrophoresis, Urine	Random Urine / 24 hrs urine	Urine container / 24 hr urine container	5 ml / 24 hrs urine collection	20 days	Blood and urine sample must be sent together. Schedule Analysis : Once in a week
17	Transferrin	Serum	Plain tube	3 ml blood	15 days	Schedule Analysis : Once in a week

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Chemical Pathology/Clinical Toxicology Laboratory

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
18	Panel Diabetes Antibodies: Anti Islet Cells (ICA), Anti-Glutamic Acid Decarboxylase (GAD) & Anti-Insulinoma-Associated Antigen 2 (IA2)	Serum	Plain tube	3ml serum, Paed min 1ml serum	15 days	-Test should be requested by Specialist or Endocrine Specialist only.
19	Insulin Autoantibodies (IAA)	Serum	Plain tube	3ml serum, Paed min 1ml serum	15 days	-Test should be requested by Specialist or Endocrine Specialist only.
20	Anti Mullerian Hormone	Serum	Plain tube	2-3ml serum, Paed min 1ml serum	15 days	-Test should be requested by Specialist or Endocrine Specialist only.
21	Ujian TDM antifungal <ul style="list-style-type: none"> ● Itraconazole ● Posaconazole ● Voriconazole ● Flucytosine ● Isavuconazole 	Serum	Plain tube	3 ml blood	10 days	- Antifungal Therapeutic Drug Monitoring (TDM) Request Form. - Test should be Sign by Specialist / Heamtologi Specialist/ Infectious Disease Specialist and Anesthesiologist Specialist only

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) –Drug & Toxicology Laboratory

NO	TEST	MEASURAND	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	6-Acetylmorphine (6-AM)	6-Acetylmorphine (6-AM)	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medicolegal cases) PER-PAT 301 form (Clinical)
2	Benzodiazepines	Alprazolam*	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medicolegal cases) PER-PAT 301 form (Clinical)
		Alpha-Hydroxyalprazolam					
		Alpha-Hydroxytriazolam					
		7- Aminoclonazepam					
		7- Aminoflunitrazepam					
		7- Aminonitrazepam					
		7- Aminonimetazepam					
		Clonazepam					
		Diazepam*					
		Flurazepam					

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Drug & Toxicology Laboratory

NO	TEST	MEASURAND	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
3	Benzodiazepines	Flunitrazepam	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
		Midazolam*					
		Lorazepam*					
		Nitrazepam*					
		Nimetazepam*					
		Nordiazepam*					
		Oxazepam*					
Temazepam*							
4	Buprenorphine	Buprenorphine	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
5	Cathinones (Khat)	Cathinones (Khat)	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Drug & Toxicology Laboratory

NO	TEST	MEASURAND	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
5	Dextromethorphan	Dextromethorphan	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
6	Fentanyl	Fentanyl	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
7	Hydrocodone	Hydrocodone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
8	Hydromorphone	Hydromorphone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
9	Ketamine	Dehydronorketamine	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
		Ketamine					
		Norketamine					

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL KUALA LUMPUR (HKL) – Drug & Toxicology Laboratory

NO	TEST	MEASURAND	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
10	Mitragnine (Ketom)	Mitragnine	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
		7-Hydroxymitragnine					
		Buprenorphine					
11	Methadone	Methadone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
12	Oxycodone	Oxycodone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
13	Oxymorphone	Oxymorphone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
14	Synthetic Cathinones	Mephedrone	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)
15	Tramadol	Tramadol	Urine	Urine container	30 ml	Medicolegal cases (65 days) Clinical Cases (20 days)	UPD-1 (Pindaan 2020) form (Medico-legal cases) PER-PAT 301 form (Clinical)

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL PERMAI JOHOR BAHRU (HPJB)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Lithium	Serum	Plain tube	3.5 ml blood	8 Working days	PER-PAT 301 form / TDM form

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL PUTRAJAYA (HPJ)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Aldosterone Aldo Renin Ratio (ARR)	Whole Blood	EDTA tube	3 ml blood	25 Working days	-Hypokalemia and certain drugs need to be avoided. -Clinical history and drug history are MANDATORY. -Test should be requested by Specialist or Endocrine Specialist only.
2	Growth Hormone (Somatotrophin)	Serum	Plain tube	3 ml blood	20 Working days	
3	Insulin Like Growth Factor-1 (IGF-1)	Serum	Plain tube	3 ml blood	26 Working days	Fasting specimen is preferable
4	Progesterone, 17-OH (17-OHP)	Serum	Plain tube	3 ml blood	26 Working days	-Keep the specimen frozen or within 2-8oC during transportation. -Synacthen Test - Please combine order of 17 OHP (0,30 and 60 minutes) in a SINGLE Request. -Do not send Grossly Hemolysed / Lipemic / Icteric Specimen
5	Renin	Whole Blood	EDTA tube	3 ml blood	26 Working days	-Hypokalemia and certain drugs need to be avoided. -Clinical history and drug history are MANDATORY. -Test should be requested by Specialist or Endocrine Specialist only
6	Sex Hormone Binding Globulins (SHBG)	Serum	Plain tube	3 ml blood	20 Working days	Testosterone result needs to be provided if Free Androgen Index (FAI) report is required.
7	Urine Cortisol, Free	24 hrs urine	24 hrs urine container without preservative	24 hrs urine collection	15 Working days	-Incomplete 24 hours urine collection may affect validity of the results. -Patients' hydration status and renal disease also influence urine cortisol excretion. -Cortisol production and therefore urinary excretion may increase during stress, surgery, acute illness and trauma. -The use of any glucocorticoid preparation should be avoided during the collection of urine.
8	Urine, Metanephrines	24 hrs urine	24 hrs urine container	24 hrs urine collection	35 Working days	

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL SELAYANG (HSEL)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Bile Acid, Total	Serum	Plain tube	4 ml blood	20 working days	PER-PAT 301 form
2	Copper, serum	Serum	Plain Tube	1 ml	20 working days	PER-PAT 301 form It is recommended to send paired sample (serum and urine specimen)
3	Copper, urine	24 hrs urine	Plain Tube/Urine Container	5 ml	20 working days	PER-PAT 301 form
4	Lead, blood	Whole Blood	EDTA Tube	2 ml	20 working days	PER-PAT 301 form

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL TUNKU AZIZAH, KUALA LUMPUR (HTA)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Acylcarnitines & Amino Acids for IEM Screening (AA_AC) with Succinylacetone	Dried blood spot	Whatmann 903 Filter paper	3 circles of Dried Blood Spot (DBS)	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021)
2	Blood Pyruvate	Blood	Obtain container from the lab	2 ml blood	-	IEM Request form, (HTA/PATH.GEN/03-2021) Send sample with ice
3	CSF & Plasma Amino Acids (AACP)	CSF & Serum / Plasma	Bijou bottle / Plain tube or Lithium Heparin tube	1 ml (CSF) and 2 ml blood	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) Serum / plasma specimen need to be centrifuge and aliquot accordingly. ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
4	Plasma Amino Acids (Full Profile)(AAP)	Plasma	Lithium Heparin tube	2 ml blood	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) Serum / plasma specimen need to be centrifuge and aliquot accordingly. ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN HOSPITAL TUNKU AZIZAH, KUALA LUMPUR (HTA)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
5	Urine Amino Acids (Full Profile)(AAU)	Urine	Urine Container without preservative	5 ml	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
6	Urine Purine & Pyrimidine (PURINEU)	Urine	Urine Container without preservative	5 ml	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
7	Urine Organic Acids (ORGANICU) with Succinylacetone	Urine	Urine Container without preservative	5 ml	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
8	Urine Sulphite & Sulphocysteine (SULPH)	Urine	Urine Container without preservative	5 ml	20 working days	IEM Request form, (HTA/PATH.GEN/03-2021) Urine Sulphite Test need to be analysed within 30 minutes from collection time. If specimen cannot be analysed within stipulated time, sample need to be frozen immediately. ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
9	Urine Cystine : Qualitative (QLCYSTINE)	Urine	Urine Container without preservative	5 ml	20 working dayss	IEM Request form, (HTA/PATH.GEN/03-2021) ALL specimen must be frozen immediately and transport with ice to Genetic Laboratory HTA,KL
10	Sirolimus	Serum	EDTA Tube	3 ml blood	8 days	Sample analysis on Tuesday and Thursday Only

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUT KANSER NEGARA, PUTRAJAYA (IKN)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Procalcitonin	Serum	Plain tube	3 ml blood	8 Working days	Fasting specimen is preferable

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN JABATAN KIMIA, JOHOR

NO	TEST	MEASURAND	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	As per request by Clinician	<i>Alkohol</i>	Blood, Urine, Stomach Content, Vomitus, Bile or Others (specify)	Sterile Container,	-	-	<i>Jabatan Kimia</i> form request (Kimia 15-Pin. 2/2016)
		<i>Racun Makhluk Perosak</i>		Urine Container,			
		<i>Dadah</i>		Tube with preservative - Sodium Fluoride (Blood / Urine),			
		<i>Bahan Kakisan / Asid</i>		Tube with Anticoagulant (Sodium Oxalate or Sodium Citrate or Others; need to specify) - applicable for Blood specimen			
		<i>Gas Karbon Monoksida</i>					
		<i>Logam</i>					
		<i>Bahan Pelarut</i>					
		<i>Lain-lain - need to specify</i>					

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN MAKMAL KESIHATAN AWAM, JOHOR BAHRU, JOHOR (MKAJB)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Adenosine Deaminase (ADA)	Pleural Fluid	Plain container (Red Cap) without additive	3 ml	10 days	MKAK form (MKAK-BPU-01/Rev2018)

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN MAKMAL KESIHATAN AWAM KEBANGSAAN, SUNGAI BULOH SELANGOR (MKAK)

NO	TEST	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	LAB TAT	REMARK
1	Methanol, Blood	Whole Blood or Plasma	K-Oxalate tube / Sodium Fluoride tube	3 ml blood	-	MKAK form (MKAK-BPU-01/Rev2018) It is recommended to send paired sampel (serum and urine) , 2 containers each.
2	Methanol, Urine	Urine	K-Oxalate tube / Sodium Fluoride tube	3 ml	-	MKAK form (MKAK-BPU-01/Rev2018) It is recommended to send paired sampel (serum and urine) , 2 containers each.
3	Vitamin B1 (Thiamine)	Whole Blood	EDTA	4 ml	10 working days (for outbreak cases) 20 working days (for surveillance)	MKAK form (MKAK-BPU-01/Rev2018) Patient Preparation: Fasting Overnight
4	Iodine	Urine	Urine container	10ml	25 working days	MKAK form (MKAK-BPU-01/Rev2018)

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
1	5-Hydroxy-Indol-Acetic Acid (5-HIAA), 24 H urine	Carcinoid tumour	5-HIAA	15 days	Biochemistry IMR Jalan Pahang KL	24-hour Urine	24 hour urine bottle with 10ml 25% HCl	2ml of 24 hour urine	<i>Please state the 24 hour urine volume collected</i>
2	Acid α -Glucosidase (POMPE), blood spot	Lysosomal Storage Diseases, POMPE	Acid α -Glucosidase	10 days	Biochemistry IMR Jalan Pahang KL	Dried blood spot	Whatmann 903 Filter paper	3 circles of DBS	<i>Ensure blood completely dried before putting in plastic sheet. Wet blood spot will be rejected</i>
3	Lysine Metabolism Profile, urine	2-aminoadipic semialdehyde dehydrogenase deficiency	Piperideine-6-carboxylate (P6C) and pipercolic acid	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	-
4	Amino Acid, CSF	Amino Acids Disorders	Amino Acids	15 days	Biochemistry IMR Jalan Pahang KL	Cerebro spinal fluid	Clean Universal bottle	1ml	<i>Must send together with plasma</i>
5	Amino Acid, plasma	Amino Acids Disorders	Amino Acids	15 days	Biochemistry IMR Jalan Pahang KL	Plasma	Heparin tube	2ml plasma	<i>Separate plasma immediately</i>
6	Amino Acid, urine	Amino Acids Disorders	Amino Acids	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Sterile Universal bottle	2ml urine	<i>After consultation only</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
7	Amino Acid, urine	Amino Acids Disorders	Amino Acids	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Sterile Universal bottle	2ml urine	<i>After consultation only</i>
8	Biogenic Amines, CSF	Neurotransmitter disorder	5-HIAA, HVA, 3 MD	15 days	Biochemistry IMR Jalan Pahang KL	Cerebro spinal fluid	Clean tube	2ml CSF	<i>Cover from light. Transport FROZEN. (Easily destroyed by heat)</i>
9	Biogenic Amines, Urine	Neurotransmitter disorder	5-HIAA, HVA, VMA	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	<i>Cover from light. Transport FROZEN. (Easily destroyed by heat)</i>
10	Biotinidase Enzyme Activity	Biotinidase deficiency	Biotinidase Enzyme Activity	10 days	Biochemistry IMR Jalan Pahang KL	Dried blood spot in filter paper	Whatmann 903 Filter paper	3 circles of DBS	<i>Ensure blood completely dried before putting in plastic sheet. Wet blood spot will be rejected</i>
11	Carnitine Total and Free, plasma	Carnitine deficiency (primary or secondary), Fatty Acids Oxidation Defects, organic aciduria	Carnitine	10 days	Biochemistry IMR Jalan Pahang KL	Plasma	Heparin tube	2ml plasma	<i>Separate plasma immediately</i>
12	Carnitine, 24Hrs urine	Fatty Acids Oxidation Defects	Carnitine	5 days	Biochemistry IMR Jalan Pahang KL	24 h urine	24 hour urine bottle	5ml of 24-h urine	<i>After consultation only. Please state the 24 hour urine volume collected</i>
13	Creatine & Guanidino acetate, urine	Creatine disorder	Creatine & Guanidino acetate	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	-

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
14	Delta-Amino Levulinic Acids (Delta-ALA), Urine	Porphyria	Delta ALA	20 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Protect from light.	2ml urine	<i>Protect from light, D-ALA easily destroyed by light</i>
15	Galactosemia Screening, blood spot	Galactosemia	Total Galactose & Galactose-1-Uridyl Transferase	10 days	Biochemistry IMR Jalan Pahang KL	Dried blood spot	Whatmann 903 Filter paper	3 circles of DBS	<i>Ensure blood completely dried before putting in plastic sheet. Wet blood spot will be rejected</i>
16	Homocysteine Total, plasma	Homocystinuria	Homocysteine	21 days	Biochemistry IMR Jalan Pahang KL	Plasma	EDTA tube	2ml plasma	<i>Separate plasma immediately</i>
17	Inborn Error Metabolism (IEM) Screening, blood spot	Inborn Error Metabolism (IEM)	Amino Acids & Acylcarnitines	10 days	Biochemistry IMR Jalan Pahang KL	Dried blood spot	Whatmann 903 Filter paper	3 circles of Dried Blood Spot (DBS)	<i>Ensure blood completely dried before putting in plastic sheet.</i>
18	Mucopolysaccharides (GAGs/HRE), urine	Mucopolysaccharidose s (MPS)	Glycosaminoglycan (GAG) or Mucopolysaccharides	10 days	Biochemistry IMR Jalan Pahang KL	First Morning Urine	Clean Universal bottle	5ml urine	-
19	Oligosaccharide, urine	Lysosomal Storage Diseases	Oligosaccharide	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	5ml urine	-
20	Organic Acids, urine	Organic Acidurias	Organic Acids	10 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	5ml urine	<i>Transport FROZEN. Organic acids easily destroyed by heat</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
21	Orotic Acids, urine	Urea Cycle Defect (ornithine transcarbamylase (OTC) deficiency, citrullinemia and ASA), hereditary orotic aciduria, purine and pyrimidine disorders and heterozygous OTC (OTC carrier)	Orotic Acid	10 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	5ml urine	
22	Panel Test: Lysosomal Storage Disorder Enzyme Assay	Lysosomal Storage Diseases: Niemann Pick Type A/B, Fucosidosis, Fabry, α -Mannosidosis, Mucopolidosis, Schindler, Aspartyl glucosaminuria, GM1-gangliosidosis, Gaucher, Tay-Sachs, Sandhoff, β -Mannosidosis, Gaucher, Krabbe, Neuronal Ceroid Lipofuscinosis (INCL/CLN1), Metachromatic Leukodystrophy	(Option maximum up to 2 diseases of enzyme): Total Aspartylglucosaminidase (GASP), Total Hexosaminidase (BHEX), Total β -Mannosidase (BMAN), β -hexosaminidase A (MUGS), α -galactosidase (AGAL), α -mannosidase (AMANP), Aryl sulphatase A (ASA), β -galactosidase (BGAL), α -mannosidase (AMAN), α -fucosidosis (AFUC), Palmitoyl-protein thioesterase (PPT), β -glucosidase (BGLU), Galactocerebrosidase (GALC), Chitotriosidase (CHITO), a-N-acetyl galactosamidase (ANAG), Acid Sphingomyelinase (ASM)	25 days	Biochemistry IMR Jalan Pahang KL	Whole blood	EDTA tube	6ml whole blood	<i>Do not spin, Do not FREEZE, send whole blood within 72 hours after collection. Option maximum up to 2 diseases of enzyme. Required consultation by geneticist.</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
23	Panel Test: Mucopolysaccharidoses Enzyme Assay	MPS type I, II, IIIA, IIIB, IVA, IVB, VII, Multiple Sulfatase	(Option maximum up to 2 diseases of enzyme): α -Iduronidase (IDA), Iduronate-2-sulphatase (IDS), Sulphaminidase (SULP), α -N-acetyl glucosaminidase (AHEX), Galactose-6-sulphatase (GALSO), β -galactosidase (BGAL), β -glucuronidase (BGLUCU), Aryl Sulphatase A (ASA)	25 days	Biochemistry IMR Jalan Pahang KL	Whole blood	EDTA tube	6ml whole blood	<i>Do not spin, Do not FREEZE, send whole blood within 72 hours after collection.</i> <i>Option maximum up to 2 diseases of enzyme. Required consultation by geneticist.</i>
24	Pipecolic acid	To differentiate between peroxisomal biogenetics and peroxisomal beta oxidation	Pipecolic acid	15 days	Biochemistry IMR Jalan Pahang KL	Plasma	Heparin	2ml plasma	<i>Separate plasma immediately</i>
25	Porphyria Profile, urine	Porphyria	Porphobilinogen (qualitative), Quantitation of Uro-, Hepta-, Hexa-, Penta-, Coproporphyrin & Total porphyrin	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	5ml urine	<i>Protect from light. Porphobilinogen and porphyrin easily destroyed by light</i>
26	Pterins, urine	Pterins disorder	Pterins	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	<i>Cover from light, Transport FROZEN. (Pterins easily destroyed by heat and light)</i>
27	Pterins, CSF	Pterins disorder	Pterins	15 days	Biochemistry IMR Jalan Pahang KL	CSF	Clean Universal bottle with preservative (DTE & EDTA) provided by Biochemistry Unit, IMR	0.5ml CSF	<i>Cover from light, Transport FROZEN. (Pterins easily destroyed by heat and light)</i> - Please collect the amber tube at unit biochemistry HSAJB before send the sample.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
28	Sialic Acid Total and Free, urine	Sialidosis/ sialuria	Sialic Acid	15 days	Biochemistry IMR Jalan Pahang KL	First Morning Urine	Clean Universal bottle	5ml urine	<i>Freeze immediately. Transport frozen.</i>
29	S-Sulphocysteine, urine	Sulphite Oxidase deficiency, Molybdenum co-factor deficiency	Sulphocysteine	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	<i>Collect WITHOUT preservative</i>
30	Succinylacetone, urine	Tyrosinemia Type 1	Succinylacetone	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2 ml urine	
31	Sugar & Polyols, urine	Carbohydrate disorders	Sugars metabolites	15 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	5ml urine	
32	Argininosuccinic Acid, urine	Argininosuccinic Aciduria	Argininosuccinic Acid	10 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	
33	Cystine & Homocystine, urine	Cystinuria & Homocystinuria	Cystine & Homocystine	10 days	Biochemistry IMR Jalan Pahang KL	Random Urine	Clean Universal bottle	2ml urine	
34	Organic Acids, plasma (Forensic Only)	Organic acidurias	Organic Acids	10 days	Biochemistry IMR Jalan Pahang KL	Plasma	EDTA/Heparin	1 ml plasma	<i>Separate plasma immediately. Transport FROZEN. Organic acids easily destroyed by heat</i>
35	Organic Acids, vitreous Humour (Forensic Only)	Organic acidurias	Organic Acids	10 days	Biochemistry IMR Jalan Pahang KL	Vitreous Humour	Clean tube	2ml vitreous humour	<i>Transport FROZEN. Organic acids easily destroyed by heat</i>
36	Creatine & Guanidino acetate, Dried Blood Spot	Creatine disorder	Creatine& Guanidino acetate	15 days	Biochemistry IMR Jalan Pahang KL	Dried blood spot	Whatmann 903 Filter paper	3 circles of DBS	<i>Ensure blood completely dried before putting in plastic sheet.</i>
37	Creatine & Guanidino acetate, Plasma	Creatine disorder	Creatine& Guanidino acetate	15 days	Biochemistry IMR Jalan Pahang KL	Plasma	EDTA/Heparin	1 ml plasma	<i>Separate plasma immediately</i>
38	Acute Intermittent Porphyrin (HMBS)-Sequencing	Acute Intermittent Porphyrin (AIP)	HMBS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
39	Acute Intermittent Porphyria (HMBS)- Deletion / Duplication	Acute Intermittent Porphyria (AIP)	HMBS gene deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
40	Alagille Syndrome (JAG1)- Sequencing	Alagille Syndrome	JAG1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
41	Alagille Syndrome (JAG1)- Deletion /Duplication	Alagille Syndrome	JAG1 gene deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
42	Alexander Disease (GFAP)	Alexander Disease	GFAP gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
43	SERPINA1	Alpha 1-Antitrypsin Deficiency	SERPINA1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
44	Angelman Syndrome (SNRPN)	Angelman Syndrome	Absence of non-methylated maternal copy of SNRPN exon 1/ promoter regions	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
45	Angelman Syndrome (UBE3A) - Sequencing	Angelman Syndrome	UBE3A gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
46	Argininosuccinate Lyase Deficiency (ASL)	Argininosuccinic Aciduria (Urea Cycle Disorders)	ASL gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
47	Argininosuccinate Synthase Deficiency (ASS1)	Type I Citrullinemia (Urea Cycle Disorders)	ASS1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
48	Aromatic Amino Acid Decarboxylase Deficiency (DDC)	Aromatic Amino Acid Decarboxylase Deficiency	DDC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
49	Berardinelli Congenital Lipodystrophy (AGPAT2)	Berardinelli Congenital Lipodystrophy	AGPAT2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
50	Berardinelli Congenital Lipodystrophy (BSCL2)	Berardinelli Congenital Lipodystrophy	BSCL2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
51	Biotinidase Deficiency (BTD)	Biotinidase Deficiency	BTD gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
52	CADASIL (NOTCH3) - Hotspots	CADASIL	NOTCH3 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
55	Canavan Disease (ASPA)	Canavan Disease	ASPA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
56	Carbamoyl Phosphate Synthetase 1 Deficiency (CPS1)	Carbamoyl Phosphate Synthetase 1 Deficiency (Urea Cycle Disorders)	CPS1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
57	Carnithine Uptake Deficiency (OCTN2)	Carnithine Uptake Deficiency	OCTN2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
58	Carnithine-Acylcarnitine Translocase Deficiency (SLC25A20)	Carnithine-Acylcarnitine Translocase Deficiency	SLC25A20 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
59	Carnitine Palmitoyltransferase 1 Deficiency (CPT1A)	Fatty Acids Oxidation Defects	CPT1A gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
60	Carnitine Palmitoyltransferase 2 Deficiency (CPT2)	Fatty Acids Oxidation Defects	CPT2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
61	Citrin Deficiency (SLC25A13)	Citrin Deficiency/ Type II Citrullinemia (Urea Cycle Disorders)	SLC25A13 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
62	Classical Galactosemia (GALT)	Classical Galactosemia	GALT gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
63	Homocysteinuria (CBS)	Homocysteinuria	CBS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
64	Dihydropyrimidinase Deficiency (DPYS)	Dihydropyrimidinase Deficiency (DHP Deficiency)	DPYS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
65	DNA Extraction and storage	DNA Extraction and storage	Genomic DNA	5 days	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
66	Ethylmalonic Encephalopathy (ETHE1)	Ethylmalonic Encephalopathy	ETHE1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
67	Fragile X Syndrome (FRAXA)	Fragile-X Syndrome	Expansion of CGG repeats of FMR1 gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
68	Fructose-1,6-Bisphosphatase Deficiency (FBP1)	Fructose-1,6-Bisphosphatase Deficiency	FBP1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
69	Fucosidosis (FUCA1)	Fucosidosis	FUCA1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
70	Floating Harbor Syndrome (SRCAP) - Hotspots	Floating Harbor Syndrome (FHS)	SRCAP gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
71	Galactokinase Deficiency (GALK1)	Galactokinase Deficiency	GALK1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
72	Galactosemia Epimerase Deficiency (GALE)	Galactosemia Epimerase Deficiency	GALE gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
73	Gaucher Disease (GBA)	Gaucher Disease (GBA)	GBA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
74	Glutaric Aciduria Type 1 (GCDH)	Glutaric Aciduria Type 1	GCDH gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
75	Glycogen Storage Disease Type 1a (G6PC)	Glycogen Storage Disease Type 1a	G6PC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
76	Glycogen Storage Disease Type 1b (SLC37A4)	Glycogen Storage Disease Type 1b	SLC37A4 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
77	Glycogen Storage Disease Type III (AGL)	Glycogen Storage Disease Type III	AGL gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
78	Hereditary Orotic Aciduria (UMPS)	Hereditary Orotic Aciduria	UMPS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
79	Hypophosphatasia (ALPL)	Hypophosphatasia	ALPL gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
80	Leber Hereditary Optic Neuropathy (LHON) Syndrome	Mitochondrial Disorders	mtDNA genes sequences (LHON Panel)	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
81	Leigh Syndrome (SURF1)	Nuclear Gene Associated with Mitochondrial Disorders	SURF1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
82	Leigh Syndrome (8993 hotspot)	Mitochondrial Disorders	mtATP6 gene sequence	1 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
83	Leigh Syndrome (mtDNA Full Panel)	Mitochondrial Disorders	mtDNA genes sequences	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
84	Leopard Syndrome (PTPN11)	Leopard Syndrome	PTPN11 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
85	Lesch-Nyhan Syndrome (HPRT1)	Lesch-Nyhan Syndrome	HPRT1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
86	Lissencephaly (DCX)	Lissencephaly	DCX gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
87	Lissencephaly (LIS1)	Lissencephaly	LIS1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
88	Long-Chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency (HADHA)	LCHAD/ Fatty Acids Oxidation Defects	HADHA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
89	Lysinuric Protein Intolerance (SLC7A7)	Lysinuric Protein Intolerance (LPI)	SLC7A7 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
90	Maple Syrup Urine Disease (BCKDHA)	Maple Syrup Urine Disease (MSUD)	BCKDHA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
91	Maple Syrup Urine Disease (BCKDHB)	Maple Syrup Urine Disease (MSUD)	BCKDHB gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
92	Maple Syrup Urine Disease (DBT)	Maple Syrup Urine Disease (MSUD)	DBT gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
93	Maple Syrup Urine Disease (DLD)	Maple Syrup Urine Disease (MSUD)	DLD gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
94	Maroteaux-Lamy Syndrome, MPS VI (ARSB)	Maroteaux-Lamy Syndrome, MPS VI	ARSB gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
95	MCT8-Specific Thyroid Hormone Cell Transporter Deficiency (SLC16A2)	MCT8-Specific Thyroid Hormone Cell Transporter Deficiency	SLC16A2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
96	Medium Chain Acyl-CoA Dehydrogenase (ACADM)	MCAD/ Fatty Acids Oxidation Defects	ACADM gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
97	Metachromatic Leukodystrophy (MLD)/ Arylsulphatase A (ARSA)	Metachromatic Leukodystrophy (MLD)	ARSA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
98	Methylenetetrahydrofolate Reductase Deficiency (MTHFR)	Methylenetetrahydrofolate Reductase Deficiency	MTHFR gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
99	Methylmalonic Acidemia (MMAA)	Methylmalonic Acidemia (MMA)	MMAA gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
100	Methylmalonic Acidemia (MMAB)	Methylmalonic Acidemia (MMA)	MMAB gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
101	Methylmalonic Acidemia (MMUT)	Methylmalonic Acidemia (MMA)	MMUT gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
102	Methylmalonic Aciduria and Homocystinuria Type C (MMACHC)	Methylmalonic Aciduria and Homocystinuria Type C	MMACHC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
103	Methylmalonic Aciduria and Homocystinuria Type D (MMADHC)	Methylmalonic Aciduria and Homocystinuria Type D	MMADHC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
104	Methylmalonyl-CoA Epimerase Deficiency (MCEE)	Methylmalonyl-CoA Epimerase Deficiency	MCEE gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
105	Mitochondrial DNA Deletion Syndromes - Kearns-Sayre Syndrome (KSS)	KSS (Mitochondrial DNA Deletion Syndromes)	mtDNA genes deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Muscle biopsy/Urine sediment/Blood	Sterile Container/Urine Container/EDTA tube	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
106	Mitochondrial DNA Deletion Syndromes - Pearson Syndrome	Pearson Syndrome (Mitochondrial DNA Deletion Syndromes)	mtDNA genes deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Muscle biopsy/Urine sediment/Blood	Sterile Container/Urine Container/EDTA tube	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
107	Mitochondrial DNA Deletion Syndromes - Chronic Progressive External Ophthalmoplegia (CPEO)	CPEO (Mitochondrial DNA Deletion Syndromes)	mtDNA genes deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Muscle biopsy/Urine sediment/Blood	Sterile Container/Urine Container/EDTA tube	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
108	Mitochondrial DNA Depletion Syndromes (ANT1)	Mitochondrial Depletion Syndromes (MDS)	ANT1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
109	Mitochondrial DNA Depletion Syndromes (DGUOK)	Mitochondrial Depletion Syndromes (MDS)	DGUOK gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
110	Mitochondrial DNA Depletion Syndromes (MPV17)	Mitochondrial Depletion Syndromes (MDS)	MPV17 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
111	Mitochondrial DNA Depletion Syndromes (POLG)	Mitochondrial Depletion Syndromes (MDS)	POLG gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
112	Mitochondrial DNA Depletion Syndromes (RRM2B)	Mitochondrial Depletion Syndromes (MDS)	RRM2B gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
113	Mitochondrial DNA Depletion Syndromes (SUCLA2)	Mitochondrial Depletion Syndromes (MDS)	SUCLA2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
114	Mitochondrial DNA Depletion Syndromes (SUCLG1)	Mitochondrial Depletion Syndromes (MDS)	SUCLG1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
115	Mitochondrial DNA Depletion Syndromes (TWINKLE)	Mitochondrial Depletion Syndromes (MDS)	TWINKLE gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
116	Mitochondrial DNA Depletion Syndromes (TYMP)	Mitochondrial Depletion Syndromes (MDS)	TYMP gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
117	Mitochondrial Neurogastrointestinal Encephalopathy (TYMP)	Mitochondrial Neurogastrointestinal Encephalopathy (MNGIE)	TYMP gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
118	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (3243 hotspot)	Mitochondrial Disorders	mt-tRNA Leu sequence	1 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood / Urine sediment / muscle biopsy	EDTA tube / Urine Container / Sterile Container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine) / muscle biopsy	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
119	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (Full Panel)	Mitochondrial Disorders	mtDNA genes sequences	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood/ Urine sediment/muscle biopsy	EDTA tube/Urine Container/Sterile Container	1-2 x 2.5ml blood EDTA or dried blood spot / urine sediment (20 mL of early morning urine) / muscle biopsy	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
120	Mitochondrial HMG-CoA Synthase Deficiency (HMGCS2)	Mitochondrial HMG-CoA Synthase Deficiency	HMGCS2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
121	Mitochondrial Short-Chain Enoyl-CoA Hydratase 1 Deficiency (ECHS1)	Mitochondrial Short-Chain Enoyl-CoA Synthase Deficiency	ECHS1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
122	Morquio A Disease (GALNS)	Morquio A Disease (MPS IVA)	GALNS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
123	Multiple Respiratory Chain Deficiencies (Mitochondrial Translation Defect) (GFM1)	Mitochondrial Translation Defect/ OXPHOS Deficiency	GFM1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
124	Myoclonic Epilepsy with Ragged-Red Fibers (MERRF) Syndrome (8344 hotspot)	Mitochondrial Disorders	mt-tRNA Lys sequence	1 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood/ Urine sediment/muscle biopsy	EDTA tube/Urine Container/Sterile Container	1-2 x 2.5ml blood EDTA or dried blood spot / urine sediment (20 mL of early morning urine) / muscle biopsy	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
125	N-Acetylglutamate Synthase Deficiency (NAGS)	N-Acetylglutamate Synthase Deficiency (Urea Cycle Disorders)	NAGS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
126	Neuropathy, Ataxia and Retinitis Pigmentosa (NARP) Syndrome (8993 hotspot)	Mitochondrial Disorders	mtATP6 gene sequence	1 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
127	Non Ketotic Hyperglycinemia (AMT)	Non Ketotic Hyperglycinemia (NKH)	AMT gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
128	Non Ketotic Hyperglycinemia (GCSH)	Non Ketotic Hyperglycinemia (NKH)	GCSH gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
129	Non Ketotic Hyperglycinemia (GLDC)-Sequencing	Non Ketotic Hyperglycinemia (NKH)	GLDC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
130	Non Ketotic Hyperglycinemia (GLDC)-Deletion/duplication	Non Ketotic Hyperglycinemia (NKH)	GLDC gene deletion / duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
131	Noonan Syndrome (PTPN11)	Noonan Syndrome	PTPN11 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
132	Ornithine Transcarbamylase Deficiency (OTC)	Ornithine Transcarbamylase Deficiency (Urea Cycle Disorders)	OTC gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
133	Phosphomannomutase 2 Deficiency (<i>PMM2</i>)	Congenital Disorder of Glycosylation (CDG) Genotyping/ Phosphomannomutase 2 Deficiency	<i>PMM2</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
134	POLG-Related Disorders (<i>POLG</i>)	POLG-Related Disorders	<i>POLG</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
135	Pompe Disease (<i>GAA</i>)	Pompe Disease	<i>GAA</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
136	Prader-Willi Syndrome (<i>SNRPN</i>)	Prader-Willi Syndrome	Absence of non-methylated paternal copy of <i>SNRPN</i> exon 1/ promoter regions	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
137	Early-onset Primary Dystonia (<i>TOR1A</i>)	Early-onset Primary Dystonia (<i>DYT1</i>)	<i>TOR1A</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
138	Primary Dystonia (<i>THAP1</i>)	Primary Dystonia (<i>DYT6</i>)	<i>THAP1</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
139	Primary Hyperoxaluria Type 1 (<i>AGXT</i>)	Primary Hyperoxaluria Type 1	<i>AGXT</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
140	Pseudorheumatoid Dysplasia (<i>WISP3</i>)	Pseudorheumatoid Dysplasia	<i>WISP3</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
141	PTEN-related disorders (<i>PTEN</i>) - Sequencing	PTEN-related disorders	<i>PTEN</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
142	PTEN-related disorders (<i>PTEN</i>) - Deletion / Duplication	PTEN-related disorders	<i>PTEN</i> gene deletion / duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
143	Purine Nucleoside Phosphorylase Deficiency (<i>PNP</i>)	Purine Nucleoside Phosphorylase Deficiency	<i>PNP</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
144	Pyruvate Dehydrogenase Deficiency (PDHA1)	Pyruvate Dehydrogenase Deficiency	PDHA1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
145	Retinoblastoma (RB1) - Sequencing	Retinoblastoma	RB1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
146	Retinoblastoma (RB1)- Deletion / Duplication	Retinoblastoma	RB1 gene deletion / duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
147	Schinzel Giedion Syndrome (SETBP1)	Schinzel Giedion Syndrome	SETBP1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
148	SCN1A-Related Seizure Disorders (SCN1A)	SCN1A-Related Seizure Disorder	SCN1A gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
149	Severe Congenital Neutropenia (ELANE)	Severe Congenital Neutropenia	ELANE gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
150	Short-chain acyl-CoA Dehydrogenase Deficiency (ACADS)	Short-chain acyl-CoA Dehydrogenase (SCAD) Deficiency	ACADS gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
151	Short-Chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency (HADH)	SCHAD/ Fatty Acids Oxidation Defects	HADH gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
152	Spinal Muscular Atrophy (SMA) - Sequencing	Spinal Muscular Atrophy (SMA)	SMN gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
153	Spinal Muscular Atrophy (SMA) - Deletion/duplication	Spinal Muscular Atrophy (SMA)	SMN1 gene deletion, copy number	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
154	Sulfite Oxidase Deficiency (SUOX)	SUOX Deficiency	SUOX gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
155	Tyrosine Hydroxylase Deficiency (TH)	Tyrosine Hydroxylase Deficiency	TH gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
156	Very Long Chain Acyl-CoA Dehydrogenase (ACADVL)	VLCAD/ Fatty Acids Oxidation Defects	ACADVL gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
157	Whole mitochondrial DNA (Full panel)	Mitochondrial Disorders	mtDNA genes sequence & deletion/ duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood/ Urine sediment/muscle biopsy	EDTA tube / Urine Container / Sterile Container	Request only by Clinical Geneticist / Neurologist. Send 1-2 x 2.5ml blood EDTA or dried blood spot / urine sediment (20 mL of early morning urine) / muscle biopsy	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.
158	Whole mitochondrial DNA (mtDNA hotspots)	Mitochondrial Disorders	mtDNA hotspot gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
159	X-Chromosome Inactivation	X-Chromosome Inactivation	Expansion of CAG repeats in exon 1 of AR gene	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
160	X-linked Adrenoleukodystrophy (ABCD1)	X-linked Adrenoleukodystrophy	ABCD1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
161	Spinocerebellar Ataxia Full Panel (SCA1, SCA2, SCA3, SCA6 and SCA7)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>ATXN1, ATXN2, ATXN3, CACNA1A</i> and <i>ATXN7</i> genes	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
162	Spinocerebellar Ataxia Type 1 (SCA1)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>ATXN1</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
163	Spinocerebellar Ataxia Type 2 (SCA2)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>ATXN2</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
164	Spinocerebellar Ataxia Type 3 (SCA3)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>ATXN3</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
165	Spinocerebellar Ataxia Type 6 (SCA6)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>CACNA1A</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
166	Spinocerebellar Ataxia Type 7 (SCA7)	Spinocerebellar Ataxia	Expansion of CAG repeats of <i>ATXN7</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
167	Mitochondrial Trifunctional Protein Deficiency-beta subunit (HADHB)	Mitochondrial Trifunctional Protein Deficiency-beta subunit (MTP)	HADHB gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
168	Kennedy Disease	Kennedy Disease	Expansion of CAG repeats in exon 1 of AR gene	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
169	Cystinuria (SLC3A1)	Cystinuria	SLC3A1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
170	Mitochondrial DNA Depletion Syndromes (TK2)	Mitochondrial Depletion Syndromes (MDS)	TK2 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
171	Short Syndrome (PIK3R1)	Short Syndrome	PIK3R1 gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
172	Testing of familial mutations/Carrier testing	Testing of familial mutations/Carrier testing	Gene sequence/ Expansion of trinucleotide repeats/ Deletion or duplication	1 month or 3 month (according to test)	Molecular Diagnostic IMR Jalan Pahang KL	Blood/ Urine sediment/muscle biopsy	EDTA tube/Urine Container/Sterile Container	1-2 x 2.5ml blood EDTA or dried blood spot / urine sediment (20 mL of early morning urine) / muscle biopsy	Send blood at ambient temperature. If >3 hours, keep sample cooled. Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory Tissue biopsy must be placed inside sterile container. Tissue biopsy must be frozen immediately after collection and sent in ice.

CHEMICAL PATHOLOGY UNIT – OFFERED TEST BY REFERENCE LAB

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
173	Specific mutation screening (1 mutation)	Specific mutation screening (1 mutation)	Gene sequence/ Expansion of trinucleotide repeats/ Deletion or duplication	1 month or 3 month (according to test)	Molecular Diagnostic IMR Jalan Pahang KL	Blood/ Urine sediment/muscle biopsy	EDTA tube/Urine Container/Sterile Container	1-2 x 2.5ml blood EDTA or dried blood spot / urine sediment (20 mL of early morning urine) / muscle biopsy	<p><i>Send blood at ambient temperature. If >3 hours, keep sample cooled.</i></p> <p><i>Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory</i></p> <p><i>Tissue biopsy must be placed inside sterile container.</i></p> <p><i>Tissue biopsy must be frozen immediately after collection and sent in ice.</i></p>
174	FGFR2-related disorders (<i>FGFR2</i>)	FGFR2-related disorders	<i>FGFR2</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
175	FGFR3-related disorders (<i>FGFR3</i>)	FGFR3-related disorders	<i>FGFR3</i> gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
176	Cartilage Hair Hypoplasia (CHH)	Cartilage Hair Hypoplasia	<i>RMRP</i> gene sequence	1 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
177	Friedreich Ataxia (FRDA)	Friedreich Ataxia (FRDA)	Expansion of GAA repeats of <i>FXN</i> gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>
178	POLG-Related Disorders (<i>POLG</i>)-Deletion/Duplication	POLG-Related Disorders	<i>POLG</i> gene deletion/duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	<i>Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.</i>

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
179	Mitochondrial Deletion	Mitochondrial Deletion	mtDNA genes deletion/ duplication	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Muscle biopsy / Urine sediment / Blood	Sterile Container / Urine Container / EDTA tube	Muscle biopsy / urine sediment (20 mL of early morning urine) / 1-2 X 2.5mL blood EDTA	<p>Send blood at ambient temperature. If >3 hours, keep sample cooled.</p> <p>Urine must be refrigerated after collection and kept chilled at all times until it arrives at the laboratory</p> <p>Tissue biopsy must be placed inside sterile container.</p> <p>Tissue biopsy must be frozen immediately after collection and sent in ice.</p>
180	MPS III B (NAGLU)	MPS III B (NAGLU)	NAGLU gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
181	Barth Syndrome (TAZ)	Barth Syndrome	TAZ gene sequence	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.
182	Prader-Willi Syndrome (uniparental disomy/imprinting defect) - (COMPULSORY TO SEND PROBAND AND BOTH BIOLOGICAL PARENTAL SAMPLES)	Prader-Willi Syndrome	Amplification of microsatellites within the critical and non-critical regions for PWS	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.
183	Angelman Syndrome (uniparental disomy/imprinting defect) (COMPULSORY TO SEND PROBAND AND BOTH BIOLOGICAL PARENTAL SAMPLES)	Angelman Syndrome	Amplification of microsatellites within the critical and non-critical regions for AS	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.

LIST OF CHEMICAL PATHOLOGY TESTS OFFERED IN INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR (IMR)

NO	TEST	DISEASE	MEASURAND / ANALYTE	LAB TAT	UNIT / CENTRE	TYPE OF SAMPLE	CONTAINER / PRESERVATIVE	VOLUME REQUIRED	REMARK
184	Myotonic Dystrophy Type 1 (DM1)	Myotonic Dystrophy Type 1 (DM1)	Expansion of CTG repeats in the DMPK gene	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	<i>Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.</i>
185	Alpha-1-antitrypsin Phenotyping (Serum)	Specific Proteins Diagnostics	Alpha-1-antitrypsin Phenotyping (Serum)	20 days	Special Protein IMR Jalan Pahang KL	Serum	Plain/Serum Tube	3.0 ml serum	<i>Serum must be refrigerated (2 to 8°C) immediately after collection.</i>
186	Transferin Quantitation, (Serum)	Specific Proteins Diagnostics	Transferin (Serum)	5 days	Special Protein IMR Jalan Pahang KL	Serum	Plain/Serum Tube	3.0 ml serum	<i>Serum must be refrigerated (2 to 8°C) immediately after collection.</i>
187	Transferin Isoform, CDG Type I & II (Serum)	Specific Proteins Diagnostics	Transferin Isoform, CDG Type I & II (Serum)	20 days	Special Protein IMR Jalan Pahang KL	Serum	Plain/Serum Tube	3.0 ml serum	<i>Serum must be refrigerated (2 to 8°C) immediately after collection.</i>

THE LIST OF OFFICER CONTACT NUMBER

Administration

- Dr Noraida Binti Khalid
 - Head of Department Senior Consultant Pathologist (Anatomic Pathology) JUSA C
 - Ext 2678/#0734

Chemical Pathology

- Dr Nur Suraya Jamalludin
 - Head of Chemical Pathology Unit & Pathologist (Chemical Pathology) UD14
 - Ext 1633/#0776

- Dr Adilah Arifin
 - Pathologist (Chemical Pathology) UD13
 - Ext 1019/#0777

- Dr Nur Suhaila Abdul Manaf
 - Pathologist (Chemical Pathology) UD13
 - Ext 1019/#0778

- Dr Mohd Jokha Bin Yahya
 - Senior Science Officer (Biochemist) C14
 - Ext 1105

- Pn Hjh Noor Hayati A. Kadir
 - Science Officer (Biochemist) C13
 - Ext 1634

- En Mohd Hasnol Bin Ahmad
 - Science Officer (Biochemist) C13
 - Ext 1104

- En Mohd Yusfairuz B. Mohd Pilus
 - Science Officer (Biochemist) C12
 - Ext 1104

- Pn Nooraishah Pairan
 - Science Officer (Biochemist) C10
 - Ext 1110

- Pn Deviga Balakersnan
 - Science Officer (Biochemist) C10
 - Ext 1110

THE LIST OF OFFICER CONTACT NUMBER

Chemical Pathology(continue...)

- Pn Suhana Razali
 - Science Officer (Biochemist) C10
 - Ext 1110

- Pn Siti Norbaiyah Binti Zainuddin
 - Science Officer (Biochemist) C10
 - Ext 1110

- Pn Izzati Binti Safiee
 - Science Officer (Biochemist) C9
 - Ext 1110

Microbiology

- Dr Dayangku Seriatul Akmar Binti Abdul Razak
 - Head of Microbiology Unit & Pathologist (Medical Microbiology) UD14
 - Ext 2660/#0781
- Dr Aishah Binti Nazir Deen
 - Pathologist (Medical Microbiology) UD14
 - Ext 2660/#0783
- Dr Nur Afiza Binti Aziz
 - Pathologist (Medical Microbiology)UD14
 - Ext 2660/#0784
- Dr Sharlini Devi Guna Segaran
 - Pathologist(Medical Microbiology) UD14
 - Ext 1662
- Dr Liow Yii Ling
 - Pathologist(Medical Microbiology)UD13
 - Ext 1662
- Dr Nurulyumni Faraha Binti Md Sharizam
 - Pathologist(Medical Microbiology)UD12
 - Ext 1662
- Dr Puvanesvari Kuppusamy
 - Science Officer (Microbiology) C14
 - Ext 1018
- En Mohd Kamrul Bin Ngah
 - Science Officer (Microbiology) C12
 - Ext 1518
- Pn Misbaha Bt Jilani
 - Science Officer (Microbiology) C12
 - Ext 1209
- Pn Anni Sofiya Binti Bachok @ Mahmood
 - Science Officer (Microbiology) C10
 - Ext 1018

Microbiology (continue...)

- Cik Nurul Syuhada Binti Muktar
 - Science Officer (Microbiology) C10
 - Ext 1018
- Pn Noraini Binti Hussin
 - Science Officer (Microbiology) C10
 - Ext 1020
- Cik Amnani Binti Jamaludin
 - Science Officer(Microbiology) C10
 - Ext 1018
- Pn Nur Hilda Hanina Binti Abd Wahab
 - Science Officer (Microbiology) C10
 - Ext 1020
- Pn Farah Binti Nooraidil
 - Science Officer (Microbiology) C9
 - Ext 1518
- Pn Suzmarni Binti Susman
 - Science Officer (Microbiology) C9
 - Ext 1518
- Pn Mogana Balachandran
 - Science Officer(Microbiology) C9
 - Ext 1518

Haematology

- Dr Indhira Subbiah
 - Head of Haematology Unit & Pathologist (Haematology) JUSA C
 - Ext 2506/#0767
- Dr Efram Bin Jamian
 - Pathologist (Haematology) UD15
 - Ext 1201/#0768
- Dr Caroline Ho Siew Ling
 - Pathologist (Haematology) UD15
 - Ext 2202/#0769
- Dr Wee Shiang Yu
 - Pathologist (Haematology) UD14
 - Ext 3473/#0770
- Dr Hari Priya Raghvan
 - Pathologist (Haematology) UD13
 - Ext 3473/#0770
- Pn Wong Tiffany Sheau Mei
 - Science Officer (Biomedical) C10
 - Ext 2937/1203
- Pn Nor Effarina Nordin
 - Science Officer (Biomedical) C10
 - Ext 2937/1203
- Pn Norhidayati Apandi
 - Science Officer (Biomedical) C9
 - Ext 2937/1203
- En Mohd Zamri Bin Abd Rahman
 - Science Officer (Biomedical) C10
 - Ext 2937/1203

Anatomic Pathology(Histopathology and Cytology lab)

- Dr Noraida Binti Khalid
 - Senior Consultant (Anatomic Pathology) JUSA C
 - Ext 2678/#0734

- Dr Hanizah Binti Khairan
 - Head of Anatomic Pathology Unit & Senior Consultant (Anatomic Pathology) JUSA C
 - Ext 2941/#0735

- Dr Raja Norazah Binti Raja Alam Shah
 - Pathologist(Anatomic Pathology) UD15
 - Ext 2360/#0737

- Dr Adrena Binti Abd Wahid
 - Pathologist (Anatomic Pathology) UD15
 - Ext 2646/#0736

- Dr Nor Syahida Binti Yusof
 - Pathologist(Anatomic Pathology) UD15
 - Ext 2646/#0738

- Dr Premalatawati A/P Krishna
 - Pathologist (Anatomic Pathology) UD15
 - Ext 2646/#0740

- Dr Jasmi Bin Ramlan
 - Pathologist (Anatomic Pathology) UD15
 - Ext 2646/#0742

- Dr. Rahimah Binti Abdul Rashid
 - Pathologist (Anatomic Pathology) UD15
 - Ext 2646/#0741

Anatomic Pathology(Histopathology and Cytology lab) (continue...)

- Dr Raja Zubaidah Binti Raja Mohamad Rasi
 - Pathologist (Anatomic Pathology) UD15
 - Ext 3452/#0743

- Dr Azah Syahrina Binti Alias
 - Pathologist (Anatomic Pathology) UD15
 - Ext 2646

- Dr Mohd Azali Zakariah
 - Pathologist (Anatomic Pathology) UD14
 - Ext 2646

- Dr Noorhafizah Wagiman
 - Pathologist (Anatomic Pathology) UD14
 - Ext 3452

- Dr Neeroshini a/p Soorianayanan
 - Pathologist (Anatomic Pathology) UD13
 - Ext 3452

- Dr Anweeitha a/p Ramasamy
 - Pathologist (Anatomic Pathology) UD13
 - Ext 1628

- Pn Nur Hanani Binti Ahmad Nakaruddin
 - Scientific Officer (Biomedical) C10
 - Ext 2679 (Histopath)

- Pn Sumaiyah Binti Khalid
 - Scientific Officer (Biomedical) C10
 - Ext 2679 (Histopath)

- Pn Wan Norsalehah Binti Wan Abdullah
 - Scientific Officer (Biomedical) C10
 - Ext 2679 (Cytology)

- Pn Munirah Binti Mohamad
 - Scientific Officer (Biomedical) C9
 - Ext 2679 (Cytology)

- En Muhammad Fakhry Amry bin Mohd Taufik
 - Scientific Officer (Biomedical) C9
 - Ext 2679

- Cik Amanda Tan
 - Scientific Officer (Biomedical) C9
 - Ext 2679

Clinical Laboratory

- Dr Nor Syahida Binti Yusof
 - Head Of Unit Clinical Laboratory & Pathologist (Anatomic Pathology) UD56
 - Ext : 2786/ SD 6388

- Pn Zuraidah Be Binti Mahmud
 - Scientific Officer (Biochemist) C10
 - Ext : 2618

Chemical Pathology/Haematology/ Clinical Laboratory

No Patient name/ RN/ No IC

Patient Name & ID on sample not clear or tally with state in request form

No Name, signature & stamp of requester

Labels on specimens and forms are not clear

Spilled Specimens, damaged and contaminated form

Total volume specimen not enough

Specimen Lysed/ clotted

Wrong or expired sample container

Using recycle request form/ wrong form

No Clinical summary/ Laboratory data/ diagnosis

Delay in receiving the sample (example coagulation test > 4 Hours)

Form not Included with specimen

Not enough copies of the form

The test is not listed in the Oncall list

Anatomic Pathology (Histopathology/Cytology)

Patient name/RN/IC No - Incomplete/not available/not clear

Patient's particular on form and specimen not tally/incomplete

Incorrect/Incomplete labelling

No evidence of payment for foreigner patient

No relevant clinical information and/or diagnosis

No name, signature & Stamp by clinician

Specimen without request form/damage request form

Specimen not included inside the container

Number of specimen not tally with the request form

Drug Laboratory

Incorrect name, identity card number or other information on the label attached to the specimen

Inconsistency between name/No. IC/Specimen received and request form/documentation attached

Bottles without seals, imperfect seals or damaged seals

There is more than one label on a specimen

No specimens included

Empty specimen bottle

No label on specimen

The specimen is leaking

Specimen volume is not sufficient

Microbiology

Clotted/hemolyzed/lipemic Specimen
Insufficient specimen
Leaking specimen
Delayed specimen/Specimen received beyond the optimum time
Specimen/form is contaminated
Incomplete form: No Patient data (Name/IC)
Incomplete form: No Ward/Clinic/Hospital
Incomplete form: No relevant clinical history
Incomplete form: No clinician's name/signature/date/stamp
Incomplete form: No date and time of specimen collection
No specialist's name/signature/stamp for special/outsourced tests
Specimen not labelled/unclear
No form/Specimen received
Wrong container/transport medium used
Information In The Form and specimen doesn't tally
Test not offered
Broken slide/container
Repeated test orders
Inappropriate specimen type for testing
Poor/Wet Smear(BFMP)
Forms not in duplicate

Any enquiries or feedbacks can be communicated to Pathology Department via

- Telephone
- In person
- Email to Haed of Pathology Department (pathologihsajb@yahoo.com.my)

Communication through telephone can be made to the following telephone extensions for unit related enquiries:

- Haematology Laboratory – 2362
- Chemical Pathology Laboratory – 2630
- Medical Microbiology Laboratory – 2662
- Histopathology Laboratory – 2364
- Cytology laboratory – 2666
- Clinical laboratory – 2618

Pathologists and doctors on call can be contacted at their telephone extensions and also via mobile phones through the hospital telephonist.

KRITERIA PENGHANTARAN UNTUK UJIAN CD4/CD8 BAGI TAHUN 2025

1. Ujian CD4/CD8 hanya ditawarkan pada hari bekerja (**Hari Isnin sehingga Khamis**) dan dikecualikan pada Hari cuti umum.
2. Ujian CD4/CD8 tidak dijalankan pada hari Jumaat.
3. Sampel darah perlu dihantar pada hari pengambilan sampel dan penerimaan sampel pada hari Khamis hanya sehingga pukul 2:30 petang.
4. Integriti sampel adalah amat mustahak dalam ujian CD4/CD8 dan ujian CD4/CD8 haruslah dijalankan dalam masa 48 jam selepas pengambilan sampel.
5. Borang ujian perlulah lengkap dengan nama pesakit, nombor kad pengenalan, wad, masa dan tarikh ambil darah, nama ujian, nama dan cop pemohon serta sejarah pesakit (clinical history).
6. Ujian CD4 CD8 **HANYA** akan dijalankan jika tarikh pengambilan spesimen ditulis dan **SEPADAN** dengan hari penerimaan specimen oleh makmal kami.
7. Permohonan khas CD4 CD8 bagi selain pesakit HIV, *ID Physician* perlu menghubungi Pakar Patologi (Hematologi) *On-Call* sebelum menghantar spesimen.
8. Sila hubungi makmal Hematologi atas talian 07-2257000 (ext no : 2362/2937) mengenai pertanyaan untuk ujian CD4/CD8.

GARIS PANDUAN UJIAN CD4/CD8: INDIKASI PERMOHONAN UJIAN

1) Semua Borang Permohonan Ujian CD4 CD8 **WAJIB** ditulis dengan COP seperti:

- a) Tarikh Akhir CD4 CD8 Count/Viral Load
- b) Tarikh Pengambilan Specimen
- c) Tarikh rawatan HAART bermula

Clinical History

RVD Diagnosed:

Start HAART Therapy:

Latest Viral LoadCopies
Date :

Latest CD 4 Count
Date :

2) Permohonan Ujian CD4 CD8 dipohon bagi kes-kes tertentu iaitu:-

* Kes baru HIV

*Pesakit yang gagal mengikuti tarikh temujanji dan rawatan doktor serta tiada keputusan Ujian CD4 CD8 tidak kurang daripada 6 bulan

*Jika pesakit menolak rawatan ARV:

- Ujian CD4 dipohon setahun sekali jika keputusan Ujian CD4 Count > 350

- Ujian CD4 dipohon setiap 6 bulan sekali jika keputusan Ujian CD4 Count < 350

*Bagi pesakit yang baru menjalani rawatan ARV, Ujian CD4 CD8 dan HIV Viral Load akan diambil selepas 4 bulan stabil pengambilan ubatan HAART.

3) Dalam 2 tahun pertama pengambilan HAART, Ujian CD4 CD8 dipohon setiap 6 bulan bersama dengan Ujian HIV Viral Load.

4) Selapas 2 tahun pengambilan HAART, Ujian CD4 CD8 dipohon setahun sekali bersama dengan Ujian HIV Viral Load.

KRITERIA UNTUK UJIAN *BONE MARROW ASPIRATION (BMA)*

Hari Ujian BMA dijalankan	Pada hari Isnin, Rabu dan Khamis bagi Wad Hematologi sahaja. Isnin hingga Khamis bagi wad-wad lain seperti Medikal, Pediatrik..etc.
Masa Membuat Panggilan untuk tarikh temujanji	Pada hari bekerja (Isnin-Khamis) – <u>1 Hari sebelum Ujian BMA dijalankan.</u> 8AM-5PM
Waktu Prosedur BMA	8AM-1PM
Had Limit Pesakit Bagi Prosedur BMA	Tidak melebihi 6 orang. Jika melebihi 6 orang pesakit bagi Ujian BMA, Pegawai Perubatan seharusnya berurusan dengan Pakar Patologi (Hematologi) <i>On-Call</i> bagi hari tersebut.
Maklumat diperlukan semasa membuat temujanji	-Nama Pesakit - IC Pesakit - Diagnosis -Tempat Prosedur
Masa Penghantaran Ujian yang dirujuk ke luar	Dari pukul 8 pagi hingga 2.30pm sahaja.
Sila hubungi Makmal Hematologi atas talian 07-2257000 (ext no : 2362) jika ada sebarang pertanyaan.	

1. Ujian BMA hanya ditawarkan pada hari bekerja dan dikecualikan pada Hari cuti awam.
2. Pegawai Perubatan **WAJIB** menghubungi Pakar Hematologi (*On-Call* bagi ujian BMA) **SEHARI SEBELUM TARIKH TEMUJANJI** melakukan ujian ini.
3. *Cut-off* masa penghantaran ujian yang dirujuk ke luar adalah sebelum pukul 2.30 petang pada hari Isnin-Khamis.

KRITERIA UNTUK UJIAN HB ANALISIS DI MAKMAL HEMATOLOGI, HSAJB

1. Berikut adalah kriteria-kriteria yang diperlukan untuk penghantaran sampel Hb Analisis / Hb Elektrophoresis :

a) Borang permohonan yang lengkap diisi dengan jelas serta tandatangan dan cop pegawai perubatan

b) Sejarah klinikal pesakit diisi di borang permohonan

c) Disertakan dengan **keputusan ujian FBC terkini dan Iron Studies (jika ada)** , jika tidak permohonan akan ditolak.

d) Disertakan dengan **slaid PBF** pesakit

e) 1- 3 ml sampel darah dalam tiub K₂EDTA (warna ungu)

f) Ujian Hb Analisis hanya ditawarkan pada hari bekerja (Hari Isnin sehingga hari Jumaat)

g) **Bagi Ujian Saringan Cascade Thalassaemia, sila gunakan cop seperti templat di bawah (sila sediakan cop) dan sertakan maklumat-maklumat yang berkaitan seperti di bawah dengan lengkap (WAJIP)**

SARINGAN CASCADE THALASSAEMIA

Nama kes indeks :

No. K/P kes indeks :

Diagnosis:

Hubungan kes indeks dengan klien :

KRITERIA UNTUK UJIAN IMMUNOPHENOTYPING

1. **Temujanji (*appointment*)** dengan Pakar Patologi (Hematologi) di HSAJB perlu dibuat sebelum sampel dihantar ke Makmal Hematologi.

Sila hubungi Makmal Hematologi atas talian 07-2257000 (ext no : 2362) untuk membuat temujanji dengan Pakar Patologi iaitu

- 1.1 Dr Indhira Subbiah (EXT 1614)
- 1.2 Dr Efram Jamian (EXT 1201)
- 1.3 Dr Caroline (EXT 1202)
- 1.4 Dr Wee Shiang Yui (EXT 3473)
- 1.5 Dr Hari Priya Raghvan (EXT 3473)

2. Berikut merupakan kriteria-kriteria yang diperlukan semasa menghantar sampel *Immunophenotyping* mengikut jenis sampel :

Sampel <i>Bone Marrow</i>	Sampel <i>Peripheral Blood</i>	Sampel CSF
3 tiub sampel dengan menggunakan K ₂ EDTA (3ml)	3 tiub sampel dengan menggunakan K ₂ EDTA (3ml)	1-2 ml sampel dengan menggunakan bijou bottle
1 direct smear Bone marrow (unstained)	1 slaid yang telah distaining dengan Leishman stain	Sampel perlu tiba di Makmal Hematologi dalam tempoh 1 jam selepas <i>lumbar puncture</i>
1 Bone Marrow Slaid yang telah distaining May-Grünwald (MGG) Stain		Sampel Sitologi perlu dihantar ke Makmal Sitologi pada waktu yang sama

3. Sampel darah perlu dihantar pada hari pengambilan sampel dan diterima oleh pihak makmal **selewat-lewatnya pukul 1 petang** (Isnin - Khamis).
4. Borang ujian perlulah lengkap dengan nama pesakit, nombor kad pengenalan, wad, masa dan tarikh ambil darah, nama ujian, nama dan cop pemohon serta sejarah pesakit (*clinical history*)
5. V Ujian *Immunophenotyping* hanya ditawarkan pada hari Isnin sehingga hari Khamis dan dikecualikan pada Hari cuti awam. Jika terdapat sampel *Urgent* pada hari Jumaat, sila hubungi Pakar Patologi (Hematologi) *On-Call* untuk membuat temujanji.
6. BMA yang dilaporkan oleh HSIJB, jika ingin membuat Ujian Immunophenotyping, sila membuat Temujanji dengan Pakar Hematologi di HSAJB.

KRITERIA PERMOHONAN UJIAN FACTOR VIII / IX / INHIBITOR ASSAYS

NO	SEMAKAN KRITERIA-KRITERIA WAJIB PERMOHONAN UJIAN FACTOR ASSAYS
1	Ujian Factor VIII / IX Assays hanya ditawarkan pada hari bekerja (Hari Isnin sehingga hari Jumaat) dan dikecualikan pada Hari cuti awam.
2	Bagi sampel yang URGENT , sila membuat temu-janji dengan Pakar Hematologi yang <i>On-Call</i> pada hari tersebut. Jika <i>Houseman</i> menghubungi Pakar Hematologi, sila memberitahu dengan jelas KLINIKAL SEJARAH PESAKIT dan jika tidak berupaya memberi penjelasan tentang klinikal pesakit, sila merujuk kepada <i>Medical Officer</i> untuk menghubungi Pakar Hematologi.
3	Borang ujian perlulah diisi dengan lengkap butiran seperti di bawah: a) Nama pesakit bersama nombor Kad Pengenalan dan Wad b) MASA dan TARIKH ambil darah c) Nama dan cop pemohon pegawai perubatan d) Sila tulis TARIKH TRANSFUSI DARAH (FACTOR LEVELS) jika ditransfusi dengan <i>Cryo / FFP / Factor VIII / Factor IX Concentrate</i> .
4	Sampel darah pesakit WAJIB ditulis samada ia adalah PRE TREATMENT atau POST TREATMENT (REPLACEMENT THERAPY) pada borang permohonan dan pada sampel. Jika tidak ditulis, ujian ini akan DITOLAK .
5	3.2% Trisodium Citrate 1ml diperlukan PRE dan 1ml untuk POST Factor Assays (2 tiub berasingan yang dilabel <i>Pre</i> dan <i>Post</i>).
6	3.2% Trisodium Citrate 2ml diperlukan Ujian Factor VIII dan IX Assays (2 tiub).
7	3.2% Trisodium Citrate 3ml diperlukan Ujian Factor Inhibitor Assays (3 tiub).
8	Jika menghantar PLASMA DARAH sampel pesakit, sila pastikan sampel plasma ini DIBEKUKAN serta-merta selepas <i>centrifuge</i> , dan penghantaran ke Makmal Hematologi menggunakan " <i>Dry Ice</i> ". Penerimaan plasma yang tidak disejuk-bekukan, akan DITOLAK.

Jika Borang Permohonan Ujian Factor Assays yang dihantar tidak ditulis **No 2 HINGGA 4** seperti jadual di atas, Makmal Hematologi akan **MENOLAK** permohonan ujian ini.

KRITERIA PENGHANTARAN UJIAN *LUPUS ANTICOAGULANT (LA)*

NO	KRITERIA PENGHANTARAN
1	Lampirkan <i>Checklist For Thrombophilia Testing</i>
2	Ujian Lupus Anticoagulant hanya ditawarkan pada hari bekerja (Hari Isnin sehingga hari Jumaat) dan dikecualikan pada Hari cuti awam.
3	Setiap permohonan Ujian <i>Lupus Anticoagulant (LA)</i> perlu menghubungi Pakar Patologi (Hematologi) On-Call sebelum menghantar spesimen.
4	Sila pastikan sampel dihantar dalam tempoh 4 jam selepas pengambilan darah atau asingkan plasma dan DIBEKUKAN serta-merta selepas <i>centrifuge</i> . Penghantaran plasma ke Makmal Hematologi hendaklah menggunakan " <i>Dry Ice</i> ". Penerimaan plasma yang tidak disejuk-bekukan, akan DITOLAK.

MAKMAL HEMATOLOGI, HSAJB
CHECKLIST (1) FOR THROMBOPHILIA TESTING

INDICATION FOR THROMBOPHILIA SCREENING			
1. LUPUS ANTICOAGULANT (LA) - (Haematology Lab HSAJB)			
Unprovoked both arterial and venous thrombosis.		1 or more unexplained fetal death >10 weeks gestation.	
Unexplained arterial thrombosis (young stroke or myocardial infarction) with <u>NO</u> risk factors & age <50 year old.		Premature birth with normal morphology <35 weeks gestation due to severe pre-eclampsia or IUGR.	
≥3 unexplained miscarriage <10 week gestation.		Patient who have unprovoked VTE if plan to stop medication.	
Diagnosis of SLE			
2. HERITABLE THROMBOPHILIA TESTING - (HOSPITAL TUNKU AZIZAH (HTA), KL)			
Neonate / children with Purpura Fulminans should be tested for Protein C & Protein S.			
Neonate with multiple unexplained thrombosis.			
Selective testing of asymptomatic 1 st degree relatives of probands with Protein C, Protein S and Antithrombin deficiency is suggested where this may influence the management of life of choice depending on personal circumstances (e.g women for decision for contraception or pregnant women with known family history of antithrombin deficiency or evidence of heparin resistance)			
Unprovoked VTE in patient age <50 years old			
Patient age <40 years old with unprovoked VTE at unusual site (portal vein, mesenteric vein, splenic vein, Budd-Chiari syndrome)			
Female patient age <40 years old with history of VTE during pregnancy contraceptive or hormone replacement therapy			
NOT INDICATED FOR THROMBOPHILIA SCREENING			
Patient who plan for continuing anticoagulant treatment		Hospitalized patient - to identify risk of acquired venous thrombosis.	
Patient who had Provoked VTE		Women with hyperstimulation ovarian syndrome	
Asymptomatic people who had 1st degree relative of DVT/ PE		During ACUTE episode of thrombotic event (to send after 8 weeks of thrombotic event)	
Heritable thrombophilia testing not recommended if only indication is thrombosis at usual site		During pregnancy (to send LA test after 8 weeks post partum)	
Not offer heritable thrombophilia testing on patient who had arterial thrombosis (e.g.young stroke/ myocardial infarction/ cardiac thrombosis) including paediatric stroke (Suggest to send LA test after 8 weeks of event)		<u>Patient on anticoagulant:</u> Warfarin : To send 2 weeks after discontinuation UFH : To send 24 hours post dose. LMWH : To send 24 hours post dose (min. 12 hours post dose) DOAC : To send 72 hours post dose	
OTHERS:	DOCTOR'S NAME & OFFICIAL STAMP:		
	DATE:		

**Anti-cardiolipin antibody & anti-Beta 2 glycoprotein antibody tests; now under Serology Lab, HSAJB since 1/2/2023

KRITERIA UNTUK UJIAN MOLECULAR QUANTITATION OF MAJOR BCR-ABL1 (P210) FOR CHRONIC MYELOID LEUKAEMIA (CML) PATIENTS

Ujian	<i>Molecular Quantitation of Major BCR-ABL1 (p210) for Chronic Myeloid Leukaemia (CML) Patients.</i>
Indikasi	Kes <i>chronic myeloid leukaemia (follow up only)</i> . Kekerapan ujian mengikut <i>local guideline for management of CML</i>
Borang permohonan ujian	Borang PER PAT 301
Spesimen	Jenis spesimen: Darah periferi Tiub : EDTA tube Volume : 6ml (Minima: 3 EDTA tiub) Sila pastikan nama dan kad pengenalan/mykid/passport yang betul pada tiub dan borang permohonan ujian
Lain – lain keperluan	<ol style="list-style-type: none"> 1. Borang permohonan ujian hendaklah diisi dengan lengkap beserta tandatangan pemohon dan cop. 2. Pastikan TARIKH dan MASA pengambilan sampel ditulis dengan jelas di dalam borang permohonan ujian. 3. Pastikan ujian yang dimohon tidak kurang daripada 6 bulan daripada ujian yang pernah dihantar sebelumnya.
Penghantaran Spesimen	<ol style="list-style-type: none"> 1. Penghantaran sampel ke Makmal Hematologi HSAJB hendaklah melalui Makmal Patologi setiap hospital. 2. Sampel hendaklah sampai ke HSAJB dalam masa 48jam. 3. Sampel hendaklah dihantar di dalam suhu 2°C - 8°C 4. Pastikan ais tidak diletakkan terus di atas sampel.
Waktu penghantaran sampel	Ujian ini ditawarkan pada <u>HARI BEKERJA SAHAJA</u> <ul style="list-style-type: none"> • Isnin Hingga Khamis; 8 pagi hingga 5 petang
Sila hubungi Makmal Hematologi atas talian 07-2257000 (ext no : 2362/2937) jika ada sebarang pertanyaan.	

KRITERIA PENGHANTARAN UNTUK UJIAN *MINIMAL RESIDUAL DISEASE (MRD)*

Ujian	<i>Immunophenotyping Minimal Residual Disease (MRD) for B-ALL</i>
Indikasi	Kes B-ALL sahaja. <i>To assess early treatment response and detect residual disease.</i>
Borang permohonan ujian	Borang PER PAT 301
Spesimen	Jenis spesimen: Bone Marrow Tiub : EDTA Volume : 9-12ml (Minima: 4 EDTA tiub) <ul style="list-style-type: none"> Sila pastikan nama dan kad pengenalan/ mykid/passport yang betul pada tiub dan borang permohonan ujian
Lain – lain keperluan	<ol style="list-style-type: none"> Borang permohonan ujian hendaklah diisi dengan lengkap beserta tandatangan pemohon dan cop. Pastikan TARIKH dan MASA pengambilan sampel ditulis dengan jelas di dalam borang permohonan ujian.
Penghantaran Spesimen	<ol style="list-style-type: none"> Penghantaran sampel ke Makmal Hematologi HSAJB hendaklah melalui Makmal Patologi setiap hospital. Sampel hendaklah sampai ke HSAJB dalam masa 24 jam. Sampel hendaklah dihantar di dalam suhu 2°C - 8°C. Pastikan ais tidak diletakkan terus di atas sampel.
Waktu penghantaran sampel	Ujian ini ditawarkan pada HARI BEKERJA SAHAJA dan dikecualikan pada hari cuti umum <ul style="list-style-type: none"> Isnin hingga Khamis (8 pagi hingga 5 petang) Sampel MRD tidak diterima pada hari Jumaat dan sehari sebelum cuti umum/cuti peristiwa
Jadual untuk MRD <i>monitoring</i> berdasarkan protokol ALL BFM (seperti yang dipersetujui oleh Pakar Onkologi Pediatrik)	<ol style="list-style-type: none"> MRD <i>monitoring</i> akan dijalankan untuk D15 dan D36 <i>assessment</i>. MRD <i>assessment</i> untuk week 12 dan week 21 hanya dijalankan jika memenuhi criteria yang dinyatakan dalam Protokol BFM (seperti Lampiran 1) Semua sampel MRD akan disaring dahulu oleh Pakar Patologi (Hematologi) di HSIJB. Semua informasi mengenai <i>timeline MRD monitoring</i> perlu ditulis dengan jelas di atas Borang Permohonan.
Protokol MASPORE dewasa (seperti yang dipersetujui oleh Pakar Hematologi Klinikal)	<ol style="list-style-type: none"> Berdasarkan lampiran yang disediakan Semua informasi mengenai <i>timeline MRD monitoring</i> perlu ditulis dengan jelas di atas Borang Permohonan. Permohonan ujian akan disaring oleh Pakar Hematologi, HSAJB.
Penolakan ujian	Ujian MRD tidak akan dijalankan bagi pesakit yang mengambil Anti-CD19 Targeted Therapy (contoh: blinatumomab atau CAR-T Cell Therapy).

LAMPIRAN K

BORANG PER-PAT 301

(PER-PAT 301)



**KEMENTERIAN KESIHATAN MALAYSIA
PERKHIDMATAN PATOLOGI
HOSPITAL SULTANAH AMINAH
JOHOR BAHRU**

UNTUK KEGUNAAN MAKMAL
LAB NO.

1. Nama:		2. No. Pendaftaran:																																														
3. No. K.P.: <input type="text"/>		4. Jantina: <input type="checkbox"/> Lelaki <input type="checkbox"/> Perempuan																																														
5. Umur:	6. Keturunan:	7. Wad/Klinik:																																														
8. Tarikh Masuk Wad:	9. Pekerjaan:	10. Taraf Perkahwinan:	11. <input type="checkbox"/> Bayar <input type="checkbox"/> Percuma																																													
12. No. Laporan Terdahulu:		13. Butiran Penting:																																														
14. Ringkasan Klinikal, Penemuan Pembedahan dan Riwayat Keluarga:		Ya Tidak																																														
		Jaundice <input type="checkbox"/> <input type="checkbox"/> Lymphadenopathy <input type="checkbox"/> <input type="checkbox"/> Hepatomegaly <input type="checkbox"/> <input type="checkbox"/> Splenomegaly <input type="checkbox"/> <input type="checkbox"/> Bleeding Tendency <input type="checkbox"/> <input type="checkbox"/> H/O Trabsfusion <input type="checkbox"/> <input type="checkbox"/>																																														
15. Diagnosis:		Haematinics _____ _____																																														
16. Kategori Permohonan/Jenis Ujian:		Drug/Chemical History _____ _____																																														
<table border="0"> <tr> <td>Patologi Kimia <input type="checkbox"/></td> <td>Klinikal <input type="checkbox"/></td> <td>Hematologi <input type="checkbox"/></td> </tr> <tr> <td>B. Sugar <input type="checkbox"/></td> <td>Bld. Count <input type="checkbox"/></td> <td>PBP <input type="checkbox"/></td> </tr> <tr> <td>B. Urea <input type="checkbox"/></td> <td>ESR <input type="checkbox"/></td> <td>BM Asp. <input type="checkbox"/></td> </tr> <tr> <td>S. Elec <input type="checkbox"/></td> <td>BFMP <input type="checkbox"/></td> <td>Hb Analysis <input type="checkbox"/></td> </tr> <tr> <td>B. Gases <input type="checkbox"/></td> <td>U. Sugar <input type="checkbox"/></td> <td>Coagulation <input type="checkbox"/></td> </tr> <tr> <td>S. Billirubin <input type="checkbox"/></td> <td>U. Alb <input type="checkbox"/></td> <td></td> </tr> <tr> <td>LFT <input type="checkbox"/></td> <td>U. Me <input type="checkbox"/></td> <td></td> </tr> <tr> <td>Se. Creatinine <input type="checkbox"/></td> <td>Stool ME <input type="checkbox"/></td> <td></td> </tr> </table>		Patologi Kimia <input type="checkbox"/>	Klinikal <input type="checkbox"/>	Hematologi <input type="checkbox"/>	B. Sugar <input type="checkbox"/>	Bld. Count <input type="checkbox"/>	PBP <input type="checkbox"/>	B. Urea <input type="checkbox"/>	ESR <input type="checkbox"/>	BM Asp. <input type="checkbox"/>	S. Elec <input type="checkbox"/>	BFMP <input type="checkbox"/>	Hb Analysis <input type="checkbox"/>	B. Gases <input type="checkbox"/>	U. Sugar <input type="checkbox"/>	Coagulation <input type="checkbox"/>	S. Billirubin <input type="checkbox"/>	U. Alb <input type="checkbox"/>		LFT <input type="checkbox"/>	U. Me <input type="checkbox"/>		Se. Creatinine <input type="checkbox"/>	Stool ME <input type="checkbox"/>		<table border="1"> <tr> <td>Histo/Saitologi</td> <td colspan="2">Mikro/Immunologi</td> </tr> <tr> <td>Specimen</td> <td>Specimen</td> <td>Ujian</td> </tr> <tr> <td></td> <td></td> <td>Ujian</td> </tr> <tr> <td></td> <td></td> <td>Ujian</td> </tr> <tr> <td></td> <td></td> <td>Ujian</td> </tr> <tr> <td></td> <td></td> <td>Ujian</td> </tr> <tr> <td></td> <td></td> <td>Ujian</td> </tr> </table>		Histo/Saitologi	Mikro/Immunologi		Specimen	Specimen	Ujian			Ujian			Ujian			Ujian			Ujian			Ujian
Patologi Kimia <input type="checkbox"/>	Klinikal <input type="checkbox"/>	Hematologi <input type="checkbox"/>																																														
B. Sugar <input type="checkbox"/>	Bld. Count <input type="checkbox"/>	PBP <input type="checkbox"/>																																														
B. Urea <input type="checkbox"/>	ESR <input type="checkbox"/>	BM Asp. <input type="checkbox"/>																																														
S. Elec <input type="checkbox"/>	BFMP <input type="checkbox"/>	Hb Analysis <input type="checkbox"/>																																														
B. Gases <input type="checkbox"/>	U. Sugar <input type="checkbox"/>	Coagulation <input type="checkbox"/>																																														
S. Billirubin <input type="checkbox"/>	U. Alb <input type="checkbox"/>																																															
LFT <input type="checkbox"/>	U. Me <input type="checkbox"/>																																															
Se. Creatinine <input type="checkbox"/>	Stool ME <input type="checkbox"/>																																															
Histo/Saitologi	Mikro/Immunologi																																															
Specimen	Specimen	Ujian																																														
		Ujian																																														
		Ujian																																														
		Ujian																																														
		Ujian																																														
		Ujian																																														
Lain-lain _____ _____		Data Makmal Terdahulu Hb _____ Platelet _____ TWDC _____																																														
17. Pengambilan Specimen: Tarikh: <input type="text"/>		Masa: <input type="text"/>																																														
18. Nama Doktor: _____		Tandatangan dan Cop Doktor																																														
19. Tarikh: _____																																																

JDT000299 PNMB-JB.

LAPORAN 'SILA LIHAT SEBELAH'

Borang IMR - Endocrine Request Form, Endocrine Unit - IMR/SDC/ENDOC/RF-01-2021



ENDOCRINE REQUEST FORM
ENDOCRINE UNIT, SPECIALISED DIAGNOSTIC CENTRE
 Institute for Medical Research
 Jalan Pahang, 50588 Kuala Lumpur
 Tel: 03-26162644/ 2645
 Email: endokrinimr@gmail.com

For Endocrine IMR use only:

Endocrine IMR Lab Number

Please stamp DATE of request and state the SAMPLE CONDITION upon receiving at ENDOCRINE IMR Laboratory

HOSPITAL/ CLINIC/ LAB: _____

A. Patient details	
1. Name:	2. R/N:
3. I/C No.: (Please use Mother's IC if newborn)	4. Date of birth:
5. Age:	6. Race: <input type="checkbox"/> Malay <input type="checkbox"/> Chinese <input type="checkbox"/> Indian <input type="checkbox"/> Other (please specify) _____
7. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	8. Ward/ Clinic:

B. Relevant clinical information and physical examination: (Please tick Yes/ No and if Yes, please specify)

1. Signs & symptoms:		
2. Family history:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Please specify : _____
3. Treatment given/ Drug therapy:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Please specify : _____
• Steroids:	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____
• Hormonal treatment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____
• Anti-reproductive therapy:	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____
• Oral hypoglycemic agents / Insulin:	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____
• Other drugs :(Please state)	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____

C. Laboratory results:

Basal Cortisol :	Blood glucose :
LH :	HbA1c:
FSH :	Blood lactate :
Progesterone :	Renal profile : Sodium : Potassium: Urea: Creat :
Testosterone :	Liver profile : ALT :AST : ALP :
Urine glucose: _____	Urine Ketones: _____
	Urine Proteins: _____
Blood Gases:	Normal / Metabolic acidosis/ Metabolic alkalosis/ Respiratory acidosis/ Respiratory alkalosis
	Anion gap: _____

Borang IMR - Request Form for Molecular Diagnostics Services, Unit of Molecular Diagnostics - IMR/SDC/UMD/REQUEST FORM



**REQUEST FORM FOR
MOLECULAR DIAGNOSTICS SERVICES**
Unit of Molecular Diagnostics
Specialised Diagnostics Centre
Institute for Medical Research
National Institute of Health, MOH
Jalan Pahang, 50588 Kuala Lumpur
Tel: 03-26162783/ 2581

IMR/SDC/UMD/REQUEST FORM

To The Requesting Lab / Person,
Please STAMP HERE

Patient Name :		Hospital :	
Patient IC/ID :		Ward/Clinic :	
Date of Birth :	Age :	Name of Attending Doctor (Specialist) :	
Gender : Male / Female / Unknown			
Ethnicity/Nationality :			
If this is a parental or family member sample, please state Proband/Child's Full Name IC/ID DOB			
Reason for Referral:			
Diagnostic test :	<input type="checkbox"/> Affected patient	<input type="checkbox"/> Possibly affected patient	
Carrier testing :	<input type="checkbox"/> Father of affected patient	<input type="checkbox"/> Mother of affected patient	
Predictive testing :	<input type="checkbox"/> Sibling of affected patient	<input type="checkbox"/> Other family member of affected patient (please specify) :	
Type of Specimen Sent:			
<input type="checkbox"/> Whole blood	<input type="checkbox"/> Blood spot	<input type="checkbox"/> Tissue (please specify) :	<input type="checkbox"/> Urine <input type="checkbox"/> Extracted DNA
<input type="checkbox"/> Others (please specify):		Date of sample taken:	
Please Read This Section Before You Proceed		Clinical Signs and Symptoms, Age of Onset, Relevant Laboratory (eg.: biochemical testing result) and Imaging Findings :	
<p><i>Requirements for clients requesting molecular diagnostics services from UMD, IMR :</i></p> <ol style="list-style-type: none"> All cases requiring molecular diagnostics testing must be referred to any Clinical Geneticist/Neurologist and they must endorse the test before any sample submission. Samples received without referral by Clinical Geneticist/Neurologist will be rejected. Please ensure that the patient and/or their legal guardian understands the implications of genetic testing and provide his/her consent to undertake the test. Please send the samples according to the criteria for sample collection as outlined below. Kindly ensure samples are sent together with both the request form and informed consent form. <p><i>Criteria for sample collection :</i></p> <ol style="list-style-type: none"> 2.5 ml blood in EDTA (purple/lavender cap) tube, DO NOT use Heparin (green cap) tube. Send about 1-2 tubes in appropriate packaging at AMBIENT condition as soon as possible after collection. If more than 3 hours, keep sample chilled. Please protect from freezing. 10 – 20 ml urine in appropriate container. Urine must be refrigerated after collection. Tissue samples must be placed inside sterile container. Please contact us for a detailed guideline on tissue sample collection, preservation and storage. DNA, urine and tissue samples must always be kept chilled until the samples arrive at the laboratory. 		<p>Clinical Diagnosis :</p> <p>Parental Consanguinity : <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pedigree (Family Tree) (Can also be attached on a separate sheet) :</p>	
I certify that the patient specified above and/or their legal guardian has been informed of the benefits, risks, and limitations of the laboratory test(s) requested. I have answered this person's questions. I have obtained informed consent from the patient or his/her legal guardian for this testing.			
Consultant's Name :		Signature and/or Stamp :	Date :

Authorized by: Head of UMD

Version No.: 9.3

21st December 2021

Page 1 of 3

Borang IMR - Request Form for Unit Protein Khas - IMR/SDC.UPK REQUEST FORM



REQUEST FORM
 Unit Protein Khas, Specialized Diagnostic Centre,
 Institute for Medical Research, Kuala Lumpur
 National Institute of Health, KKM
 Tel: 03-2616 2669/2731
 Email: prot.umdp@moh.gov.my

IMR.SDC.UPK.REQUEST FORM

*To The Requesting Lab / Person,
 Please STAMP HERE*

Patient name :		Hospital :	Ward :
IC number :		Registration No. (RN) :	
Age :	Gender : <input type="checkbox"/> Male <input type="checkbox"/> Female	Hospital contact:-	
Ethnic:	Nationality:	Tel. no :	
Clinical Diagnosis: A) Multiple Myeloma New case <input type="checkbox"/> Follow up case <input type="checkbox"/> B) Other than Multiple Myeloma <i>(please specify):</i>		Laboratory findings (for Multiple Myeloma) : Hemoglobin (Hb) : g/dL White Cell Count : x10 ⁹ /L Urea : mmol/L Creatinine : μmol/L Calcium (corrected) : mmol/L ESR : mm/H X-ray : Peripheral Blood Film: BM aspirate : Treatments: Stem cell transplant:	
Clinical Symptoms & Signs: <input type="checkbox"/> Anaemic <input type="checkbox"/> Bone fracture <input type="checkbox"/> Bone pain <input type="checkbox"/> Constitutional symptoms <input type="checkbox"/> Hepato/Splenomegaly <input type="checkbox"/> Infections <input type="checkbox"/> Lymphadenopathy <input type="checkbox"/> Muscle weakness <input type="checkbox"/> Nephrotic syndrome <input type="checkbox"/> Peripheral neuropathy <input type="checkbox"/> Prolonged Jaundice <input type="checkbox"/> Respiratory symptoms <input type="checkbox"/> Vision problem <input type="checkbox"/> No symptom related to M protein <input type="checkbox"/> Others <i>(please specify):</i>			
Test requested :			
A. Multiple Myeloma :- i) Protein Electrophoresis, Serum <input type="checkbox"/> ii) Protein Electrophoresis, Serum and Urine <input type="checkbox"/> iii) Free Light Chain Quantitation, Serum <input type="checkbox"/>		B. Specific Protein Quantitation :- i) Transferrin, Serum <input type="checkbox"/> ii) Alpha 1 Antitrypsin, Serum <input type="checkbox"/> iii) Beta 2 Microglobulin, Serum <input type="checkbox"/>	
Types of specimen:	<input type="checkbox"/> Serum <input type="checkbox"/> Urine <input type="checkbox"/> CSF	C. Protein Profiling :- i) Transferrin Isoform, Serum <input type="checkbox"/> ii) Alpha 1 Antitrypsin Phenotyping, Serum <input type="checkbox"/> iii) Oligoclonal Band, CSF and Serum <input type="checkbox"/>	
Date of sample collection:			
Doctor in-charge : Sign and Stamp : Date:			
Guidelines for sample collection, storage and transportation:			
(i) SERUM : a) At least 3mL of serum in plain tube. b) Serum condition must be clear and not hemolysed, turbid or lipaemic. c) Refrigerate serum immediately after collection.		(ii) URINE : a) At least 25mL of 24Hr urine in sterile container. OR b) At least 25mL of random urine in sterile container. c) Refrigerate urine immediately after collection. d) URINE SAMPLE MUST BE ACCOMPANIED WITH SERUM SAMPLE TOGETHER.	
		(iii) CSF : a) At least 1mL of CSF in bijou bottle or sterile container. b) It is recommended to collect both CSF and serum sample at the same time. c) Freeze CSF immediately after collection. d) CSF SAMPLE MUST BE ACCOMPANIED WITH SERUM SAMPLE TOGETHER.	
Transport all specimens in ice to the laboratory.			

Borang IMR - IEM Request Form, Biochemistry Unit - IMR/SDC/BC/FORM-RQ



IEM REQUEST FORM
 BIOCHEMISTRY UNIT, SPECIALISED DIAGNOSTIC CENTRE
 INSTITUTE FOR MEDICAL RESEARCH (IMR)
 Jalan Pahang, 50588 Kuala Lumpur, Malaysia
 Contact No. : 03-26162640 / 2649 / 2796
 www.imr.gov.my

IMR Lab. Number

IMPORTANT NOTICE: To ensure correct, reliable result and interpretation given, the following must be followed :

1. Please fill up the entire form.
2. At least 2ml plasma and 5ml urine are required.
3. Separate plasma / serum from RBC immediately. Grossly hemolysed samples will be rejected.
4. All samples (plasma / urine / CSF) must be frozen immediately and transport in DRY ICE to IMR.
5. For enzyme assays, please send chilled whole blood in EDTA tube (DO NOT SPIN, DO NOT FREEZE).

Name : _____ Age : _____ Sex : M / F / U Race : M / C / I / O
 RN : _____ ID : (preferably patient's IC) _____ Hospital : _____ Ward : _____
 Address : _____ Tel : _____

1. Symptoms / Signs of Current Illness :

Fever		Poor sucking / feeding	
Pallor		Respiratory problem	
Jaundice		Difficulty in breathing	
Hypothermia		Mental retardation	
Hypotonia / floppy		Developmental delay	
Cyanosed		Failure to thrive	
Lethargy		Feeding intolerance	
Easily irritable		Septicaemic-like illness	
Seizures or h/o seizures		Headache	
Drowsy		Smelly urine	
Coma		Colored urine	
Abnormal behaviour		Skin lesions	
Frequent vomiting		Eye lesions	

Other symptoms / signs :

2. Feeding History :

Type of milk : Breast / Formula / Mixed /
 Solid diet : _____

3. Family History : Consanguinity : Yes / No. If Yes please specify : _____

Occurrence of	Stillbirth	Neonatal death	Neonatal seizures	Metabolic disease
in				
Siblings				
Maternal side				
Paternal side				

4. Physical Examination :

Respiratory distress		Hyperreflexia	
Dysmorphic features		Nystagmus	
Hypothermia		Optical atrophy	
Cardiomyopathy		Ptosis	
Drowsy		Abnormal odour	
Coma		Abnormal hair	
Opisthotonus		Hepatomegaly	
Dystonia		Splenomegaly	
Choreoathetoid movement		Eczema / Other rashes	
Hypotonia		Others (specify)	

5. Treatment Given : (specimen should be taken before any form of treatment given or stop for 2-3 days)

Drug therapy :
 Antibiotic : No / Yes _____
 Steroid : No / Yes _____
 Anticonvulsant : No / Yes _____
 Other drug : (please state) _____
 Fluid infusion : Saline / Dextrose /
 Mannitol / Parenteral
 feeding /
 Others : _____

6. Lab Result : (before treatment is given)

LFT
 ALT : _____ U/L **Blood Glucose** : _____ mmol/L
 AST : _____ U/L **Blood Ammonia** : _____ umol/L
 ALP : _____ U/L **Blood Lactate** : _____ mmol/L
 Pyruvate : _____ mmol/L

Urine Analysis
 pH : _____
 Ketones : Pos / Neg
 Reducing Sugar : Pos / Neg
Anion Gap : _____

Blood Gases : Normal / Met acidosis / Met alkalosis / Resp acidosis / Resp alkalosis

CT Scan / MRI : _____
 Other relevant test (specify) : _____

Provisional Diagnosis : _____

Borang Permohonan Ujian Molekular, Hospital Tunku Azizah, Kuala Lumpur

MAKMAL GENETIK
 JABATAN PATOLOGI
 HOSPITAL TUNKU AZIZAH
 Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.
 Telefon: 03-2600 3000 Sambungan: 1134 (Genetik Molekul)
 Email: molekulargenetik.hta@moh.gov.my

HTA/PAT/GEN/PK-01-02

UNTUK KEGUNAAN MAKMAL-

No Genetik:

BORANG PERMOHONAN UJIAN MOLEKULAR / MOLECULAR TESTS REQUEST FORM**Nota:**

1. Semua permintaan ujian Targeted Gene Panel bagi Kanser Genetik hendaklah didahului dengan temujanji.
2. Ujian Molekular: 3-5mL darah dalam dua tiub EDTA sahaja.
3. Kanser tisu padat: Ujian ini memerlukan blok paraffin atau slaid yang belum diwarnakan. Blok paraffin yang dipilih haruslah mempunyai sekurang-kurangnya 70% sel tumor atau sekurang-kurangnya 50 sel tumor. 5-10 slaid tisu yang belum diwarnakan daripada sampel biopsi dipotong pada ketebalan 5µm.

MAKLUMAT PESAKIT / PATIENT'S INFORMATION

NAMA NAME		TARIKH LAHIR DATE OF BIRTH	UMUR AGE
NO KP/ID ALTERNATIF: NRIC/ ALTERNATIVE ID:		BANGSA RACE	JANTINA SEX
WAD/HOSPITAL WARD/HOSPITAL		TARIKH PENGAMBILAN SAMPEL SAMPLE COLLECTION DATE	
TUJUAN RUJUKAN/REFERRAL REASON <input type="checkbox"/> Diagnostic Test <input type="checkbox"/> Carrier Screening: <input type="checkbox"/> DNA Extraction & Storage <input type="checkbox"/> Others:			
JENIS SPESIMEN/ SPECIMEN TYPE <input type="checkbox"/> Whole Blood <input type="checkbox"/> Tissue: Block/Slides No: <input type="checkbox"/> Saliva <input type="checkbox"/> Others:			
RINGKASAN KLINIKAL CLINICAL HISTORY	Current treatment: <input type="checkbox"/> TKI: <input type="checkbox"/> others:		
SALASILAH KELUARGA FAMILY PEDIGREE	Sejarah keluarga/perkahwinan keluarga terdekat/penyakit genetik/keguguran/kematian bayi. SALASILAH WAJIB DIKEPILKAN DI HELAIAN LAIN. History of consanguinity/genetic disorders/affected family members/abortions/early neonatal deaths. PEDIGREE IS COMPULSORY TO BE ATTACHED IN A SEPARATE DOCUMENT.		
DIAGNOSIS KLINIKAL CLINICAL DIAGNOSIS			
STATUS PENYAKIT DISEASE STATUS	<input type="checkbox"/> New Diagnosis <input type="checkbox"/> Remission <input type="checkbox"/> Relapse <input type="checkbox"/> Others :		
KEPUTUSAN MAKMAL LAB INVESTIGATIONS	Previous genetic tests/HPE :		
PENYAKIT KONGENITAL CONGENITAL DISORDERS		GENETIK KANSER/ CANCER GENETICS	
<input type="checkbox"/> Duchenne Muscular Dystrophy <input type="checkbox"/> Becker Muscular Dystrophy <input type="checkbox"/> Rett Syndrome <input type="checkbox"/> Beckwith-Wiedemann Syndrome <input type="checkbox"/> Russell-Silver Syndrome <input type="checkbox"/> Y-Microdeletion <input type="checkbox"/> CGH Microarray <input type="checkbox"/> Others:		<input type="checkbox"/> EGFR mutation testing <input type="checkbox"/> KRAS mutation testing <input type="checkbox"/> Microsatellite Instability (MSI) Testing <input type="checkbox"/> Lung Cancer Gene Panel <input type="checkbox"/> Breast/Ovarian Cancer Gene Panel <input type="checkbox"/> Colorectal/Gastric Cancer Gene Panel <input type="checkbox"/> Others:	
Tandatangan dan Cop Rasmi Pakar/Pakar Perunding: Tarikh: No. Telefon & Emel:			

Borang Permohonan Ujian IEM, Hospital Tunku Azizah, Kuala Lumpur

MAKMAL GENETIK
JABATAN PATOLOGI
HOSPITAL TUNKU AZIZAH
Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.
Telefon: 03-2600 3000 Sambungan: 1132 (IEM)
Email: iemlab.hta@moh.gov.my

HTA/PAT/GEN/PK-01-03

UNTUK KEGUNAAN MAKMAL:

No Makmal:

BORANG PERMOHONAN UJIAN IEM / IEM REQUEST FORM**Nota:**

1. **Sampel air kencing:** 2-3mL urin dalam botol urin steril tanpa pengawet. Untuk beberapa permohonan ujian urin, 3mL urin diperlukan di dalam satu botol urin steril. Ujian Urin Sulphite perlu dijalankan dalam masa 30 minit selepas pengumpulan urin. Jika waktu pengantaraan melebihi 30 minit, sila bekukan urin dengan kadar segera.
2. **Sampel Plasma/Serum:** 0.5mL (pediatrik) dan 2mL (dewasa) sampel darah dalam tiub Lithium Heparin/Plain tube. Emparkan darah dengan kadar segera dan pindahkan plasma/serum ke dalam plain tube/tiub mikro.
3. **Sampel CSF:** 1mL CSF dalam plain tube (tanpa gel)/botol Bijou.
4. Semua sampel (plasma/serum/urin/CSF) mestilah dibekukan dengan kadar segera dan dihantar di dalam bekas berisi ais ke Makmal Biokimia Genetik (IEM), HTA.

MAKLUMAT PESAKIT / PATIENT'S INFORMATION

NAMA NAME	TARIKH LAHIR DATE OF BIRTH	UMUR AGE
NO KP/ID ALTERNATIF: NRIC/ ALTERNATIVE ID:	KETURUNAN ETHNICITY	JANTINA SEX
WAD/HOSPITAL WARD/HOSPITAL	TARIKH PENGAMBILAN SAMPEL SAMPLE COLLECTION DATE	

RINGKASAN KLINIKAL / CLINICAL HISTORY

Symptom & Tanda-tanda Penyakit / Symptoms & signs of current illness			
<input type="checkbox"/> Septicaemia-like illness	<input type="checkbox"/> Neurological	<input type="checkbox"/> Failure to thrive	<input type="checkbox"/> Dysmorphism
<input type="checkbox"/> Recurrent infection	<input type="checkbox"/> Seizures or h/o seizure	<input type="checkbox"/> Poor sucking feeding	<input type="checkbox"/> Macrocephaly
<input type="checkbox"/> Respiratory distress	<input type="checkbox"/> Hypotonia/floppiness	<input type="checkbox"/> Feeding intolerance	<input type="checkbox"/> Microcephaly
<input type="checkbox"/> Prolonged jaundice	<input type="checkbox"/> Mental retardation	<input type="checkbox"/> Recurrent vomiting	<input type="checkbox"/> Hepatomegaly
<input type="checkbox"/> Metabolic acidosis	<input type="checkbox"/> Developmental delay	<input type="checkbox"/> Hypoglycemia	<input type="checkbox"/> Splenomegaly
<input type="checkbox"/> Eczema/other rashes	<input type="checkbox"/> Coma	<input type="checkbox"/> Unusual odours	<input type="checkbox"/> Cardiomyopathy
Lain-lain/Others (specify):			
Sejarah Keluarga / Family history			
<input type="checkbox"/> Consanguinity	<input type="checkbox"/> Recurrent abortions/stillbirth	<input type="checkbox"/> Recurrent neonatal death	<input type="checkbox"/> Siblings affected
Maklumat Pemakanan / Dietary Information			
Type of milk: Breast / Formula / Mixed / Solid Diet / Others:			
Rawatan yang diberi (sebelum pengambilan spesimen) / Treatment given (prior to specimen collection)			
Drugs: (antibiotic / anticonvulsant / steroid / others):			
Fluid infusion: Saline / Dextrose / Mannitol / Parenteral Feeding / Others:			
Keputusan makmal / Lab results:		Permintaan Ujian / Test Request:	
ALT: AST: ALP: Blood glucose: Blood ammonia: Blood lactate: Blood pyruvate: Ketones: Positive / Negative Reducing sugar: Positive / Negative Blood Gases: <input type="checkbox"/> Normal <input type="checkbox"/> Metabolic Acidosis/Alkalosis <input type="checkbox"/> Respiratory Acidosis/Alkalosis Anion Gap: Other relevant test (specify):	No.	Tests	Tick(✓)
	1.	Dried Blood Spot: Acylcarnitines & Amino Acids for IEM Screening (AA_AC) <input type="checkbox"/> With Succinylacetone (tick if required)	
	2.	CSF & Plasma Amino Acids (AACP)	
	3.	Plasma Amino Acids (Full profile) (AAP)	
	4.	Plasma Amino Acids (MSUD)	
	5.	Plasma Amino Acids (PKU)	
	6.	Serum Amino Acids (Full profile) (AAS)	
	7.	Urine Amino Acids (Full profile) (AAU)	
	8.	Urine Purine & Pyrimidine (PURINEU)	
	9.	Urine Organic Acids (ORGANICU) <input type="checkbox"/> With Succinylacetone (tick if required)	
	10.	Urine Sulphite & Sulphocysteine (SULPH)	
	11.	Urine Cystine: Qualitative (QLCYSTINE)	
	12.	Urine Cystine & Homocystine: Quantitative (CYS_HOMO)	

DIAGNOSIS:

Tandatangan dan Cop Rasmi Pakar/Pakar Perunding:

Tarikh:
No Telefon:
Email:

Borang Permohonan Ujian Makmal MKAK, Sg Buloh - MKAK-BPU-U01/Rev2018

MKAK-BPU-U01/Rev2018

BORANG PERMOHONAN UJIAN MAKMAL (SPESIMEN KLINIKAL)
MAKMAL KESIHATAN AWAM

NO RUJUKAN MAKMAL (MKA) :

A. MAKLUMAT PESAKIT					
Nama Pesakit:		Umur:	No Rujukan Pesakit (R/N):		
No K.P./ Lain-lain:		Jantina: L / P			
Warga Negara:		Bangsa:	Wad:		
Alamat pesakit:		Pekerjaan:	Status perkahwinan Tanda (√) yang berkenaan:		
		No. Tel.:	<input type="checkbox"/> Bujang	<input type="checkbox"/> Berkahwin	<input type="checkbox"/> Lain-lain
B. TUJUAN PERSAMPELAN Tanda (√) yang berkenaan			C. LAIN-LAIN MAKLUMAT		
Wabak/ Kluster	<input type="checkbox"/>	Pesakit (Ada gejala)	<input type="checkbox"/>	Lokaliti kejadian:	
Survelan	<input type="checkbox"/>	Kes	<input type="checkbox"/>		
Diagnostik	<input type="checkbox"/>	Kontak	<input type="checkbox"/>	Sejarah melancong: Ada / Tiada	
Projek	<input type="checkbox"/>	Kluster	<input type="checkbox"/>	Negara:	
Lain-lain	<input type="checkbox"/>		<input type="checkbox"/>	Tarikh keluar:	
				Tarikh masuk:	
D. RINGKASAN KLINIKAL			Tanda (√) yang berkenaan		
			Tanda dan Gejala	Ada (√)	Tarikh onset
			1) Demam (°C)		6)
			2) Selsema		7)
			3) Cirit-birit		8)
			4) Muntah		9)
Status & tarikh imunisasi berkaitan: Ada _____ Tarikh _____ Tiada _____ Tidak diketahui _____					
E. MAKLUMAT SPESIMEN					
Jenis Spesimen	Jenis ujian dipohon	Tarikh diambil	Tarikh dihantar	Tanda Tangan Pegawai yang mengambil spesimen (sila cop)	
* Nota: Sila rujuk Service Handbook Makmal Kesihatan Awam Kebangsaan untuk maklumat lanjut tentang spesimen					
F. BUTIRAN PEMOHON			G. BUTIRAN MAKMAL TRANSIT		
Nama			Nama		
Jawatan			Jawatan		
Tempat bertugas (sila cop)			Tempat bertugas (sila cop)		
No H/P:	Email:		No tel & samb.	Email:	
KK/PKD/Hospital:			Nama Pusat Transit:		
Daerah:	Negeri:		Daerah:	Negeri:	
H. MAKMAL (untuk kegunaan MKA):					
Unit Pengurusan Spesimen		Makmal		Catatan	
Suhu: °C		Jenis sampel:		Terima / Tolak	
Sampel: Terima / Tolak		Sampel dlm transport media:		Suhu: °C	
		Ya / Tidak			
Nama Penerima :		Nama Penerima:			
Tarikh & masa:		Tarikh & Masa:			
Keputusan ujian disahkan oleh :			Tarikh:		

Borang Jabatan Kimia, Malaysia - Kimia 15-Pin. 2/2016

(Kimia 15-Pin. 2/2016)

**BORANG PERMOHONAN BAGI PEMERIKSAAN FORENSIK / TOKSIKOLOGI**

Borang ini perlulah dilengkapkan dengan jelas oleh Pegawai Perubatan dan disertakan bersama spesimen kepada:

Cop Meterai/Seal Keselamatan

JABATAN KIMIA MALAYSIA

*PETALING JAYA (03-79853000)/ IPOH (05-5477744)/ ALOR SETAR (04-7357001)/
PULAU PINANG (04-2228300)/ MELAKA (06-2331406)/ JOHOR BAHRU (07-2226366)/
KUANTAN (09-5662400)/ K. TERENGGANU (09-6203077)/ KOTA BHARU (09-7647632)/
KUCHING (082-313011)/ SIBU (084-213890)/ BINTULU (086-334211)/ KOTA KINABALU
(088-259090).

Bahagian 1:

a) Butiran Kes Hidup Mati Tandakan (✓) yang berkenaan

* Bulatkan yang berkenaan

Nama (HURUF BESAR): _____	
No. Kad Pengenalan/ Passpot/ Surat Beranak: _____	
No. Pendaftaran Hospital: _____	Jantina: *Lelaki/Perempuan
No. Autopsi: _____	Umur: _____
Pekerjaan: _____	Warganegara: _____
Tarikh dan masa kemasukan: _____ a.m./p.m. pada: _____	
Tarikh dan masa kematian: _____ a.m./p.m. pada: _____	
Balai Polis: _____	No. Repot Polis: _____

b) Keadaan Kes: *Makan racun atau ubat/jatuh dari bangunan/kemalangan jalanraya/
gantung diri/mati mengejut/mati lemas/jasad reput

Lain-lain: _____


c) Bawah pengawasan pegawai perubatan: *Ya/Tidak

Jika ada, apakah rawatan yang diberikan (termasuk ubatan): _____

d) Pemindahan darah dijalankan semasa pengawasan/sebelum kematian: *Ya/Tidak/Tidak diketahui

Nota: Analisis toksikologi tidak akan memberi apa-apa makna sekiranya spesimen darah diambil selepas proses pemindahan darah.

Borang PAP smear PS 1/98 (Pindaan 2019)

KEMENTERIAN KESEHATAN MALAYSIA PERKHIDMATAN PATOLOGI		PS 1/98 (Pindaan 2019)
		No. Makmal:
BORANG PERMOHONAN UJIAN HPV/ SITOLOGI (PAP SMEAR /LBC) <i>HPV TEST /CYTOLOGY (PAP SMEAR/LBC) REQUEST FORM</i>		
Hospital / Klinik <i>Hospital / Clinic</i>		
BUTIRAN PELANGGAN / CLIENT'S BIODATA		
I. Nama / Name :	v. Alamat : Address	
II. No Kad Pengenalan / IC No		
III. Etnik / Ethnicity :		
IV. Umur / Age :	vi. No Telefon: Phone No	(Rumah/ Home) (Pejabat/ Office)
BUTIRAN SARINGAN / SCREENING INFORMATION (Tandakan X pada kotak berkenaan)		
I. Tarikh sampel diambil: Date sample taken	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	v. No. Makmal terdahulu: Previous Laboratory No.
II. Jenis Sampel: Type of sample	<input type="checkbox"/> Conventional Pap Smear <input type="checkbox"/> Liquid-based preparation <input type="checkbox"/> Cervical/vaginal swab for HPV	- HPV - Pap Smear - Histopathology
III. Bahagian sampel diambil: Sample site	<input type="checkbox"/> Serviks / cervix <input type="checkbox"/> Vagina / Vagine	vi. Keputusan terdahulu: Previous diagnosis
IV. Jenis saringan: Type of screening	<input type="checkbox"/> Pertama / new <input type="checkbox"/> Ulangan / repeat	vii. Pengambilan Sampel Oleh Sampling by
RINGKASAN KLINIKAL / CLINICAL SUMMARY (Tandakan X pada kotak berkenaan)		
I. Status Hormon: Hormonal status	<input type="checkbox"/> Hamil / Pregnant <input type="checkbox"/> Postpartum / Postpartum <input type="checkbox"/> Pre-menopaus / Pre-menopausal <input type="checkbox"/> Post-menopaus / Menopausal	vi. Gejala / Tanda: Symptom / Sign
II. Tarikh Haid terakhir: Last menstrual period	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Tiada / Nil <input type="checkbox"/> Lerihan dari lejang / Vaginal discharge <input type="checkbox"/> Pendarahan luar biasa / Abnormal bleeding Nyatakan / specify:
III. Tarikh Kelahiran terakhir: Last childbirth	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	vii. Serviks : Cervix
IV. Kontraseptif / Terapi hormon: therapy:	<input type="checkbox"/> ADR / IUCD Hormon / Hormone Nyatakan / Specify:	<input type="checkbox"/> Biasa / Normal <input type="checkbox"/> Luar Biasa / Abnormal <input type="checkbox"/> Tiada serviks / Absent cervix
v. Sejarah Rawatan : Treatment history	<input type="checkbox"/> Kimoterapi / Chemotherapy <input type="checkbox"/> Radiasi dibahagian pelvis / Pelvic radiation Nyatakan tarikh akhir rawatan: Specify completion date:	viii. Maklumat tambahan: Additional information
- Tahun Akhir Saringan Pap smear / HPV Diambil		
MAKLUMAT PEMOHON / REQUESTING PRACTITIONER		
Nama : Name	Jawatan / CCP: Designation / Stamp	
Tanda Tangan : Signature		

Borang PAP smear PS 1/98 (Pindaan 2007)

PS 1/98 (Pindaan 2007)


**KEMENTERIAN KESIHATAN MALAYSIA
PERKHIDMATAN PATOLOGI**
**BORANG PERMOHONAN PAP SMEAR
PAP SMEAR REQUEST FORM**

No. Sitologi:

Hospital / Klinik <i>Hospital / Clinic</i>	
BUTIRAN PELANGGAN / CLIENT'S BIODATA	
i. Nama / Name:	
ii. No. Kad Pengenalan / IC, No.	
iii. Etnik / Ethnicity:	
iv. Umur / Age:	
v. Alamat: Address	
vi. No. Telefon: Phone No.	
(Rumah/Home) (Pejabat/Office)	
BUTIRAN SARINGAN / SCREENING INFORMATION	
i. Tarikh sampel diambil: Date sample taken	
ii. Jenis Sampel: Type of sample	
iii. Bahagian sampel diambil Sample site	
iv. Jenis saringan: Type of screening	
v. No. sitologi terdahulu: Previous cytology No.	
vi. No. patologi terdahulu: Previous pathology No.	
vii. Tempat saringan terdahulu: Place of previous screening	
viii. Keputusan terdahulu: Previous diagnosis	
RINGKASAN KLINIKAL / CLINICAL SUMMARY	
i. Status Hormon: Hormonal status	
ii. Tarikh Haid terakhir: Last menstrual period	
iii. Kontraseptif / Terapi hormon: Contraceptive / hormonal therapy:	
iv. Sejarah Rawatan Treatment History	
v. Gejala / Tanda: Symptom / Sign	
vi. Serviks : Cervix	
vii. Maklumat tambahan : Additional information	
MAKLUMAT PEMOHON / REQUESTING PRACTITIONER	
Nama : Name	
Jawatan / CAP : Designation / Stamp	
Tandatangan : Signature	

C-PNMB, PK

Borang Tuntutan Sample

HSAJB/PAT-16/VER1.0/2020

BORANG TUNTUTAN SAMPEL TISU HSAJB

NAMA JABATAN / UNIT / WAD :

NO. TEL / EXT :

TARIKH / MASA :

NAMA WARIS YANG MENUNTUT	
NO. KAD PENGENALAN WARIS	
NO. TELEFON WARIS	
NAMA (PESAKIT / "BABY OF")	
NO. KAD PENGENALAN	
NO. PENDAFTARAN HOSPITAL (R.N)	

.....
 (NAMA & TANDATANGAN / COP RASMI
 PEGAWAI PERUBATAN / PAKAR
 MERAWAT)

*UNTUK KEGUNAAN WAD / JAB / UNIT

* UNTUK SIMPANAN WARIS YANG MENUNTUT

PER : MENUNTUT SAMPEL TISU

NAMA WARIS YANG MENUNTUT	
NO. KAD PENGENALAN WARIS	
NO. TELEFON WARIS	
NAMA (PESAKIT / "BABY OF")	
NO. KAD PENGENALAN	
NO. PENDAFTARAN HOSPITAL (R.N)	

1. Sampel tisu yang telah dihantar ke makmal hanya boleh dituntut selepas laporan lengkap dikeluarkan (**sekurang-kurangnya 2 minggu dari tarikh penerimaan spesimen**).
2. Kerjasama Tuan / Puan adalah dipohon untuk menuntut sampel tisu dalam tempoh 3 bulan dari tarikh pelaporan. Pihak kami tidak akan bertanggungjawab di atas sebarang permasalahan yang timbul selepas tempoh tersebut.
3. Tuntutan boleh dilakukan di Makmal Histopatologi, Jabatan Patologi HSAJB pada:
Ahad - Isnin : 8.00 pagi - 1.00 petang dan 2.00 petang - 5.00 petang.
Khamis : 8.00 pagi - 1.00 petang dan 2.00 petang - 3.30 petang.
4. Waris yang mengambil sampel tisu tersebut adalah bertanggungjawab sepenuhnya ke atas sampel.
5. Sila hubungi bilik Pegawai Perubatan (**ext 2679**) atau Makmal Histopatologi (**ext 2364**) untuk pertanyaan lanjut.

Saya No. K/P.....
 (WARIS YANG MENUNTUT)

Dengan ini memahami serta jelas dengan keterangan di atas.

.....
 (T/TANGAN WARIS)

TARIKH / MASA :

Borang Permintaan Bahan Makmal


 BORANG PERMINTAAN BAHAN MAKMAL
 BAGI JABATAN PATOLOGI HSAJB


NAMA PESAKIT : _____
 NO K/P : _____
 DIAGNOSIS : _____

JENIS BAHAN MAKMAL YANG DIPOHON (SILA TANDAKAN /) :

1	PERIPHERAL BLOOD FILM SLIDE	
2	BONE MARROW ASPIRATION SLIDE	
3	HISTOPATHOLOGY SLIDE	
4	HISTOPATHOLOGY BLOCK	
5	CYTOLOGY SLIDE	

Nama dan tandatangan pegawai yang memohon : T.T _____ Cop _____

Nama dan tandatangan Pakar Patologi yang meluluskan : T.T _____ Cop _____

Nama dan tandatangan pegawai yang menerima : T.T _____ Cop _____

[*Semua slide yang dipohon **WAJIB** dikembalikan]

BORANG UNTUK DIISI OLEH PEGAWAI DI JABATAN PATOLOGI.HSAJB

BUTIRAN SLIDE YANG DIBERIKAN:

NO.			

Nama dan tandatangan pegawai yang menjaga : T.T _____ Cop _____

Consent From Clinical Post-Mortem Examination

MINISTRY OF HEALTH MALAYSIA

CONSENT FORM FOR CLINICAL POST-MORTEM EXAMINATION

A. AGREEMENT TO A POST-MORTEM EXAMINATION

I
 (Identification / passport No) do not object to a
 post-mortem examination being carried out on the body of

(Identification / passport No) in order to find the
 cause of death and study the effects of treatment. I understand that this examination may involve **tissue
 samples or fluids being taken and help for laboratory investigation**. If the deceased is an adult, has he or
 she ever expressed an objection to this type of examination (as far as you know)? Yes No

B. LIMITED POST-MORTEM EXAMINATION

*You may limit the extent of the examination. The person who gave you this form will explained the options
 an implications to you.*

Do you wish to limit the examination? Yes No

If 'yes', where do you want the examination limited to ?

The head _____

The chest _____

The abdomen _____

C. ORGANS BEING TAKEN AND HELD

You may agree or disagree too whole organs being taken for any futher examination which could provide a more detailed understanding of the illness.

Tick one of the statements below to indicate whether or not you agree to organs being taken and held.

I do not object to any organs being taken for further investigations if this is necessary to fully understand the cause of death and effects of treatment.

I object to any organs being taken for futher investigations.

I object to the following organs being taken for futher investigations. (Please list organs below)

- a) _____
- b) _____
- c) _____
- d) _____

D. DISPOSAL OF ANY TISSUE OR ORGANS TAKEN

After any futher investigation of tissue or organs taken, those tissue samples or organs must be disposed of in a lawful way. You can either arrange this yourself or the hospital can do it.

Tick one of the statements below to show how any tissue samples or organs should be disposed of

The hospital may dispose of the tissue samples or organs in a lawful and respectful way.

I will arrange for the tissue samples or organs to be disposed of in a lawful way.

I prefer the tissue samples or organs to be reunited with the body before it is relased, even though this may delay the funeral.

E. MEDICAL RESEARCH AND EDUCATION

Surat Pekeliling Ketua Pendarah Kesihatan Malaysia Bil. 17/ 2008Page 2

You may agree or disagree to some tissue, fluids or organs being taken and held for an unlimited time for medical research and education.

Tick one of the statements below to show whether or not you agree to any tissue, fluids or organs being taken and held for medical research and education.

I do not object to any tissue, fluid or organ being taken for medical research and education.

I object to any tissue, fluid or organ being taken for medical research and education.

I object to the following tissue, fluids or organs being taken for medical research and education.

(Please list the tissue, fluids and organs below)

- a) _____
- b) _____
- c) _____

Your signature :

Relationship to deceased :

Date :

Witness's signature :

Name :

Identification / passport No. :

Position :

