KEMENTERIAN KESIHATAN MALAYSIA

HOSPITAL TELUK INTAN

2023

PATHOLOGY SERVICES HANDBOOK

Pathology Department

3rd Edition

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1. FOREWORD FROM HOSPITAL DIRECTOR

It is with immense pleasure and profound pride that I extend my warmest greetings to all our esteemed colleagues, healthcare professionals, and staff as we mark a significant milestone in the history of our hospital. Today, we embark on an extraordinary journey with the launch of "The third edition of Teluk Intan Pathology Handbook" – a comprehensive guide designed to bolster our commitment to delivering the highest standards of patient care and healthcare excellence.

In the ever-evolving landscape of medicine, pathology remains an indispensable pillar in diagnosing and understanding diseases. As the Hospital Director, I firmly believe that a strong foundation in pathology is essential for every healthcare professional. This handbook is a testament to our dedication to fostering continuous learning, professional development, and the relentless pursuit of knowledge.

Within the pages of this handbook, our exceptional team of pathologists, scientific officers and medical technologists experts have diligently compiled a wealth of vital information, methodologies, and diagnostic insights. This guide serves as an invaluable resource to aid our healthcare professionals in navigating the complexities of various laboratory tests, empowering them to make accurate and appropriate clinical decisions.

At our hospital, we have always embraced innovation and embraced the advancements in medical science. This handbook reflects our commitment to staying at the forefront of medical knowledge and ensuring that our patients receive the best possible care. As we equip our medical community with this comprehensive resource, we are confident that it will not only enrich their expertise but also elevate the overall quality of patient care.

This handbook is more than just a collection of facts and figures; it symbolizes the spirit of collaboration and teamwork that defines our hospital. The dedication and hard work of our pathology team, in conjunction with the support of every department, has made this project a reality. I extend my heartfelt gratitude to all those involved in its creation.

As we embrace this new era of medical knowledge, let us remember that learning is a never-ending voyage. We must continually seek new understandings, hone our skills, and adapt to emerging challenges. The Pathology Handbook will serve as an enduring companion in our pursuit of excellence.

In conclusion, I am immensely proud of the collective efforts that have culminated in this invaluable handbook. I believe it will serve as a beacon of knowledge, guiding us through the complexities of pathology and reinforcing our commitment to compassionate patient care.

May this handbook empower our healthcare professionals and inspire us all to reach greater heights in the noble pursuit of healing and wellness.

Sincerely,

Dr Khairul Baharin Bin Mohd Baharuddin
Hospital Director
Hospital Teluk Intan

2. FOREWORD FROM HEAD OF DEPARTMENT OF PATHOLOGY

As the Head of the Department of Pathology, it gives me great pleasure and honor to introduce the eagerly awaited 3rd Edition of our Pathology Handbook. Today, we celebrate a momentous occasion as we unveil this updated compendium, which stands as a testament to our unwavering commitment to advancing the frontiers of diagnostic excellence and patient care.

Pathology, the backbone of modern medicine, plays a pivotal role in unraveling the intricacies of diseases and providing vital insights into patient management. With each passing day, we witness remarkable progress in medical science, and this edition reflects our dedication to staying at the vanguard of these advancements. It encompasses the latest knowledge and information regarding our scope of service.

As we navigate the ever-evolving landscape of medicine, collaboration and continuous learning remain pivotal. I am proud to acknowledge the relentless efforts of our exceptional team of pathologists, scientific officers and medical laboratory technologists who have meticulously contributed their expertise to this handbook. Their dedication has not only enriched this resource but has also elevated the overall standards of our department.

In this edition, we have diligently accumulated the contents to cover the recent most changes and improvements made in the department. It is crucial to acknowledge that this handbook would not have been possible without the unwavering support of our hospital administration, dedicated staff, and the trust of our patients. The relentless pursuit of excellence in patient care remains at the core of our department's values, and this handbook serves as a beacon to guide us on this path.

As we launch this 3rd Edition of the Pathology Handbook, I am confident that it will continue to serve as an indispensable resource for healthcare practitioners and all hospital staffs alike. Let it be a source of inspiration for us all to embark on a journey of lifelong learning, innovation, and collaboration, all in the pursuit of exceptional patient care.

In conclusion, I extend my deepest gratitude to everyone involved in the creation of this remarkable handbook. Together, we stand united in our commitment to illuminating the path to diagnostic excellence and shaping a brighter, healthier future for our patients.

Sincerely,

Dr Abdul Kadir Rifaei Bin Abdul Rashid Khairi
Head of the Department of Pathology
Hospital Teluk Intan

3. EDITORIAL COMMITTEE MEMBERS

Advisor	:	Dr. Abdul Kadir Rifaei Bin Abdul Rashid Khairi
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Contributors	:	Dr. Nor Akmal Binti Mokhtar Dr. Amrah Binti Ismail Dr. Chitranjini A/P Nadaraja Dr. Ling Pei Chi Dr. Masturah Binti Ramli Dr. Zaharina Wati Zaharuddin Dr. Ashwini A/P Rajagopal Dr. Izian Munirah Binti Ahmad Kushairi Dr. Nurul Adani Binti Annas Dr. Muhd. Faez Bin Ismail Pn. Zuraidah Binti Mokhtar Pn. Sharmawati Binti Samsudin Pn. Nahairiah Binti Yusnora

4. MINISTRY OF HEALTH'S OBJECTIVE, VISION AND MISSIONS

4.1 Objective

To assist an individual in achieving and sustaining as well as maintaining a certain level of health status to further facilitate them in leading a productive lifestyle - economically and socially.

This could be materialized by introducing or providing a promotional and preventive approaches, other than an efficient treatment and rehabilitation services, which is suitable and effective, whilst priorities on the less fortunate groups.

4.2 Vision

A nation working together for better health.

4.3 Mission

The mission of the Ministry of Health is to lead and work in partnership:

i. to facilitate and support the people to:
   - attain fully their potential in health
   - appreciate health as a valuable asset
   - take individual responsibility and positive action for their health

ii. to ensure a high-quality health system that is:
   - customer centered
   - equitable
   - affordable
   - efficient
   - technologically appropriate
   - environmentally adaptable
   - Innovative

iii. with emphasis on:
   - professionalism, caring and teamwork value
   - respect for human dignity
   - community participation

5. PATHOLOGY DEPARTMENT'S OBJECTIVES, VISION, MISSION AND CLIENT CHARTER

5.1 Objectives

I. Provides diagnostic services in the following areas: Hematology, Chemical Pathology, Microbiology (Bacteriology/ Serology), Anatomic Pathology and Blood Transfusion.

II. Provides consultation services to clinical specialists and medical officers in hospitals and clinics.

III. Provide training to personnel in the departments, hospitals, clinics, and students from the Institutes of Higher Education and other government agencies.

IV. Conducting research and collaborate in research to develop the field of Pathology.

5.2 Vision

Providing efficient, accurate and innovative pathology services based on a quality system that meets customer satisfaction.

5.3 Mission

The Department of Pathology will be an excellent service provider using the appropriate and up-to-date technology with staff who are knowledgeable, pure-hearted, sensitive to customer needs based on an outstanding quality service, teamwork and professionalism towards giving the best in patient treatment.

5.4 Client Charters

i. Every customer will be treated politely and professionally.

ii. Every customer will be given an explanation on the tests offered if necessary.

iii. Each specimen will be handled and tested according to the standard operating procedures.

iv. All patient information and test results is private and confidential.

v. Customer Satisfaction Survey will be conducted twice a year.

vi. Pathology Department will ensure each KPI (Key Performance Indicator) that has been set by the Ministry of Health is up to the standard.

vii. URGENT test request, which is clearly indicated, will be processed within the specified laboratory turnaround time (LTAT).

MINISTRY OF HEALTH
MALAYSIA

CARTA ORGANISASI JABATAN PATOLOGI & TRANSFUSI HOSPITAL TELUK INTAN

PENGARAH HOSPITAL
DR. KHAIRUL BAHARIN

TIMBALAN PENGARAH
DR. HJH. NOOR AZIRA

KETUA JABATAN PATOLOGI
DR. ABDUL KADIR RIFAEI

HISTOPATOLOGI / SITOLOGI

PAKAR PATOLOGI
DR MASTURAH RAMLI UD52

PEG. PERUBATAN
Dr PARAMESWARY UD48
DR.NABILAH UD44
DR.M.FAEZ UD48
DR.LEE C.L UD43

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JTMP
HAZIZAHTUL U32
NOR AZURA U32(KUP)
M. IZZUDDIN U29
SHARIZA U29

SITO

JTMP
NAHAIRIAH U29
NUR ANA
SYUHADA U29

INTEGRASI

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DR.LIM SAY MIN UD56
DR.CHITRANJINI UD54
DR.NURSYAHIRAH UD54
DR.LING PEI CHI UD52

PEGAWAI SAINS
PN.SALINA C48
PN.CHEW SWEE MING C44
KOSONG C41

JTMP
NORLELA U32
MOHD ASWADY U32
NORHAYATIE U32(KUP)
A.FARWIS U32 TBK 1
NADIA U32 TBK 1
NORAIMI U32 TBK 1
RUSWANI U32 TBK 1
A.ZULAIZI U29
HARYATI U29
NORATIQAH U29
FATKHATUN U29
KARTHIKESAN U29
LOW KIEU LING U29
NOORHAFAREE U29
NOR AZURA U29
MOHD ALIAS U29
PRIYASHINI U29
SIMAA U29

PPK
M.FUAT U14
NORMA U14
MUHAMAD U11
M.SUHAILI U11
ANUAR U11
M.ARAFAT U11

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UD41(K)
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KOSONG U36

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SITI ROHANA N22(TBK)

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PN NURASYKIN C44
PN AZIYANI C44
PN NADZIRAH C41
PN NURUL FARZANA C41

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KESITA U32
EMMI ELIANA U32
YUGANESWARY U32TBK 1
MASSYUHAIDA U29
AINON MARDIAH U29
SITI HIDA U29
NAGESWARY U29
NOORAZDIANA U29
DANIA U29
NORSYAHIRAH NABEELA U29
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PEG.PERUBATAN
DR.ZAHARINA WATI UD54
DR. ASHWINI UD43
DR JANANI UD48
DR SITI AISYAH UD43(K)
DR DIYANA ASHIKIN UD43

J/TERLATIH
SALLINA U32(KUP)
ROSNITA U32(KUP)

PEN.PEG.PER
M. TAUFIK U29

PEN.PEG.PEN
KHAIRUL
AKMAL S29

JTMP
FAZLIANA U32
NORAIN CHEW U32
TBK1
NURUL 'AIN U29
BAANUMATHI U29
SURESH U29
NURUL IZYAN U29
NOR ATIRA U29
NORRAZYANTI U29

PPK
M. AZMIN U14(KUP)
PUSPARAJ U11

PEMANDU
KOSONG H11
TAJUL H11
RAVI H11

DIKEMASKINI
05.07.2023

6. GENERAL INFORMATION

6.1. Introduction

The Pathology Department, Hospital Teluk Intan aims to provide an accurate laboratory results in a timely manner. This handbook is intended to provide all users with a quick and concise guide to the range of services provided by the department and other referral centres under Kementerian Kesihatan Malaysia as well as the pre-analytical steps for proper collection and submission of the tests.

6.2. Operating Hours

UNIT	OPERATING HOURS
Integrated Laboratory	
I. Hematology	24 hours*
II. Chemical Pathology	24 hours*
III. Drugs Laboratory	Monday to Friday (8.00 am to 5.00 pm)
IV. Outsource Unit	Monday to Friday (8.00 am to 5.00 pm)
Microbiology Laboratory	
I. Bacteriology	24 hours*
II. Serology	Monday to Friday (8.00 am to 5.00 pm)
III. Outsource Unit	Monday to Friday (8.00 am to 5.00 pm)
Histopathology & Cytopathology Laboratory	Monday to Friday (8.00 am to 5.00 pm)
Blood Bank	24 hours*

**Out of office hour, laboratory will be handled by two (2) oncall staffs only for each unit.*

6.3. Contact Numbers

Any queries or problems can be directed to the following personnel:

UNIT	LOCATION	PHONE NUMBER (EXT)
Pathology	Administrative Office	8940
Integrated Laboratory	Head of Unit and Chemical Pathologist Hematologist Medical Officer Chemical Pathology Unit Hematology Unit Outsource Unit	8449 8466 8575 8460 8461 8576
Microbiology Laboratory	Head of Unit and Clinical Microbiologist Microbiology Laboratory Serology Laboratory	8449 8453 3454
Anatomic Pathology Laboratory	Head of Unit and Anatomic Pathologist Histopathology and Cytopathology Laboratory	8940 8459
Blood Bank	Head of Unit and Transfusion Medicine Specialist Medical Officer Blood Bank	7144 7145 8464

6.4 Referral Centre Lists and Schedule

Referred Test
Tests that is not offered in Hospital Teluk Intan will be referred to nearest referral Kementerian Kesihatan Malaysia (KKM) Laboratory.

Referred tests will be handled by the Outsource Unit in Integrated and Serology Unit during **office hours only**. For urgent request out of office hour, please consult Pathologist on-call. Please refer to the 'Referred Test' section for details regarding the type of sample, volume, container, form and any special requirements for the required test.

Please refer to our land transport and postage schedule to aid in making arrangement with patient for sampling time.

LAND TRANSPORT

DAY	DESTINATIONS
MONDAY	Hospital Ipoh, Perak
TUESDAY	Hospital Ipoh & Taiping, Perak
WEDNESDAY	Hospital Ipoh, Perak
THURSDAY*	Hospitals/ Centres in Klang Valley
FRIDAY	Hospital Ipoh, Perak

**Kindly arrange appointment for fresh samples with referral laboratory in Klang Valley on Thursday only. Please contact Pathology Department for arrangement of transport of URGENT sample, other than the listed schedule*

POSTAL SERVICE

DAY	DESTINATIONS
MONDAY	-
TUESDAY	Klang Valley & Penang Hospitals
WEDNESDAY	-
THURSDAY	Klang Valley & Penang Hospitals
FRIDAY	-

6.5 General Pre-Analytical Requirements

6.5.1 Request form (PER PAT 301)

A standard laboratory request form is use for all tests except for specialized and referred tests, which require special forms. Figure below showed the standard guideline in filling up the form

GARIS PANDUAN MENGISI BORANG PERMOHONAN UJIAN PERKHIDMATAN PATOLOGI PER PAT 301

PENGENALAN PER PAT FORM 301

- Borang Permohonan Ujian Perkhidmatan Patologi (PER-PAT-301) ini telah disediakan oleh Jabatan Patologi, Hospital Kuala Lumpur dengan kerjasama Bahagian Perkembangan Perubatan dan Unit Sistem Maklumat & Dokumentasi, Kementerian Kesihatan Malaysia.
- Borang ini diwujudkan bagi tujuan penyeragaman borang-borang makmal terdahulu melalui satu borang makmal yang merangkumi keseluruhan ujian-ujian perkhidmatan Patologi.
- Borang ini digunapakai bagi semua permohonan ujian-ujian yang berkaitan dengan perkhidmatan Patologi kecuali ujian-ujian yang mempunyai borang khas.
- Borang hendaklah dilengkapkan dengan menggunakan garis panduan yang betul. Borang yang tidak lengkap dikhuatiri akan memberi kesan kepada interpretasi keputusan ujian pesakit.

1-11: PENGENALAN PESAKIT

- Sila isi nama dengan **HURUF BESAR.**
- Tuliskan nombor KP dengan lengkap.
- WAJIB ada dua (2) identiti pesakit bagi memastikan sampel diambil dari pesakit yang betul.
- Jantina, umur dan tarikh lahir pesakit hendaklah diisi supaya nilai julat rujukan (*reference range*) dapat dikeluarkan.
- Lokasi pesakit adalah **WAJIB** bagi pemakluman keputusan yang kritikal.

12 & 14. RINGKASAN KLINIKAL

- 12: Sila nyatakan nombor laporan terdahulu (jika ada).
- 14: Tuliskan riwayat pesakit (history), pemeriksaan fizikal, penemuan radiologi dan keputusan ujian yang berkaitan.
- Jika pembedahan sudah dijalankan sila tuliskan jenis, tarikh, lokasi dan penemuan pembedahan
- Bagi kes sakit puan, spesimen untuk Saitologi / Histopatologi - Menstrual Cycle, Last Menstrual Period (LMP), Hormonal Therapy, dll perlu dituliskan.
- Penggunaan antibiotik perlu ditulis jika permohonan untuk kategori Mikrobiologi diminta.

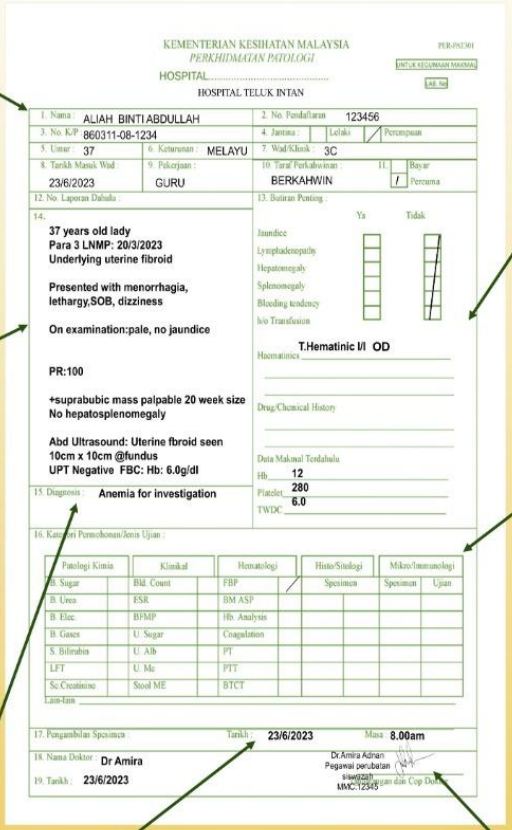
15. DIAGNOSIS

- Tuliskan diagnosis klinikal (dilarang menggunakan *abbreviation*).
- Diagnosis pesakit sangat penting bagi tujuan validasi keputusan dan mengesan kehadiran *analytical errors*.

17. PENGAMBILAN SPESIMEN

- Tuliskan tarikh dan waktu sampel diambil bagi memastikan sampel masih stabil pada waktu ujian dijalankan dan bagi makmal mematuhi tempoh pengujian yang ditetapkan **TAT *(Turnaround time)*.**
- Jika keputusan ujian diperlukan dengan kadar segera (***URGENT****), sila cop ***URGENT*** pada borang.
- Penyalahgunaan label ***URGENT***: Permohonan ***less urgent/ routine*** yang dimohon secara ***URGENT*** akan mengakibatkan keputusan ***URGENT*** yang sebenar akan tertangguh.

****URGENT-** Keputusan ujian yang diperlukan dengan kadar segera bagi pengurusan kes kecemasan atau kes yang memerlukan perhatian segera yang boleh menyebabkan morbiditi dan kematian (mortality).*



KEMENTERIAN KESIHATAN MALAYSIA
PERKHIDMATAN PATOLOGI
HOSPITAL.....
HOSPITAL TELUK INTAN

1. Nama : ALIAH BINTI ABDULLAH
2. No. Pendaftaran : 123456
3. No. K/P : 860311-08-1234
4. Jantina : Lelaki / Perempuan
5. Umur : 37
6. Keturunan : MELAYU
7. Wad/Klinik : 3C
8. Tarikh Masuk Wad : 23/6/2023
9. Pekerjaan : GURU
10. Taraf Perkahwinan : BERKAHWIN
11. Bayar / Percuma
12. No. Laporan Dahulu :
13. Butiran Penting :

14.
37 years old lady
Para 3 LNMP: 20/3/2023
Underlying uterine fibroid

Presented with menorrhagia, lethargy,SOB, dizziness

On examination:pale, no jaundice

PR:100

+suprabubic mass palpable 20 week size
No hepatosplenomegaly

Abd Ultrasound: Uterine fbroid seen
10cm x 10cm @fundus
UPT Negative FBC: Hb: 6.0g/dl

Ya / Tidak
Jaundice
Lymphadenopathy
Hepatomegaly
Splenomegaly
Bleeding tendency
h/o Transfusion

T.Hematinic I/I OD
Hematinics
Drug/Chemical History
Data Makmal Terdahulu
Hb 12
Platelet 280
TWDC 6.0

15. Diagnosis : Anemia for investigation

16. Kategori Permohonan/Jenis Ujian :

Patologi Kimia	Klinikal	Hematologi	Histo/Sitologi	Mikro/Imunologi
B. Sugar	Bld. Count	FBP	Specimen	Specimen / Ujian
B. Urea	ESR	BM ASP		
B. Elec.	BFMP	Hb. Analysis		
B. Gases	U. Sugar	Coagulation		
S. Bilirubin	U. Alb	PT		
LFT	U. Mc	PTT		
Sc Creatinine	Stool ME	BTCT		

Lain-lain

17. Pengambilan Spesimen : Tarikh : 23/6/2023 Masa : 8.00am
18. Nama Doktor : Dr Amira
19. Tarikh : 23/6/2023
Dr Amira Adnan
Pegawai perubatan
MMC:12345

13. BUTIRAN PENTING

- Tandakan (/) dikotak yang berkenaan.
- Tuliskan sejarah *hematinics* dan ubat yang relevan bagi pesakit.
- Senaraikan keputusan ujian-ujian terkini bagi pesakit yang relevan dengan ujian yang dimohon.

16. KATEGORI PERMOHONAN

- Tandakan(/) di kotak yang berkenaan untuk setiap permohonan.
- **1 PESAKIT, 1 BORANG UNTUK 1 KATEGORI UJIAN sama ada:**
  - **Patologi Kimia (Biokimia)**
  - **Hematologi**
  - **Mikrobiologi**
  - **Histo/Sitologi**
- Tandakan (/) untuk jenis ujian yang diminta atau tuliskan jenis ujian yang dipohon di ruang lain-lain.
- Sila nyatakan jenis sampel yang dihantar.

18-19: NAMA,TARIKH,TANDATANGAN & COP

- Setiap permohonan **WAJIB** ditandatangani dan dicop oleh pemohon.
- Bagi ujian khas, sila pastikan **PAKAR** menandatangan dan mengecop borang permohonan bagi mengelakkan penolakan sampel.
- Cop mesti mengandungi jawatan (Contoh: Pegawai Perubatan atau Pakar).

Disediakan oleh:
Jabatan Patologi, Hospital Teluk Intan
Tarikh Kemaskini: 30 Jun 2023

6.5.2 Samples/ Specimens

i. Samples and specimens should be collected by ward or clinic staff using appropriate technique and correct containers.
ii. The specimen containers must be labeled with at least two identifiers (patient's name and IC number) and name of the test requested
iii. The specimen containers should be placed in biohazard plastic bags with the respective request forms attached to the bag.

6.5.3 Types of Containers and Order of Draw

I. Specimens should be sent to laboratory in appropriate containers. The sequence of filling of the blood tube should follow the Order of Draw (Table 1). Proper order in filling of blood collection tubes is important to prevent the risk of tube additive contamination.

II. This is important to ensure a reliable result can be produced, improper sequence may result in scenario such as:

    i. Contamination with tube additive due to prior filling of an EDTA lavendar tube followed by plain tube. This may cause a spuriously low calcium level and high sodium and potassium level.

    ii. Microbial contamination risk if blood culture bottles are filled after other blood collection tubes.

III. In order to prevent contamination, the order of draw shall be practised following the following table (Table 1).

Table 1: Order of Draw

Sequence	Tube/ Bottle	Name of tube/ bottle	Number of inversion for proper mixing
1		Blood culture bottles	8 - 10 times
2		Sodium Citrate tube	3 - 4 times
3		Plain tube with serum separator tube	5 times
4		Lithium heparin tube	8 - 10 times
5		EDTA tube	8 - 10 times
6		Fluoride/ Oxalate tube	8 - 10 times
7		ESR Tube	8 - 10 times

Table 2: Other Types of Containers/ Medium

No	Tube/ Bottle	Name of Tube/ Bottle
1		Universal Container
2		Stool Container
3		24-hour urine container
4		Bijou bottle
5		Carry Blair Swab
6		Amies Swab
7		Amies Charcoal Swab
8		1 ml syringe

6.5.4 Transportation of specimen

a. The specimens should be transported to the laboratory within the appropriate time frame and appropriate method according to the type of samples (e.g.: by hand or pneumatic tube).

b. Please refer to the test list for details of each tests.

7. REJECTION OF SAMPLES

7.1. Specimens and forms received will be checked by the laboratory staff regarding the acceptance for analysis based on the rejection criteria (Figure). Any rejection shall be informed to the respective ward/clinic via phone or rejection form (). For in-house tests, the request shall be registered and a rejection note shall be made in the system. For referred tests, rejection form will be dispatched to the respective location.

8. RESULTS/ REPORTS

8.1. Results are validated by Pathologist/ Medical Officer/ Scientific Officer or Medical Laboratory Technologist according to the test following laboratory turnaround time.

8.2. Reference ranges are provided for all results where applicable. These may be subjected to variation differentiated by age and sex where important/ available.

8.3. Reports are viewed through LIS for internal samples and samples referred to HRPB. For referred tests other than HRPB, printed results will be dispatched to the requesting location respectively.

9. CRITICAL VALUE NOTIFICATION

9.1. Critical value is a when a test result or value that falls outside the critical limits or the presence of any unexpected abnormal findings, cells or organisms which may cause imminent danger to the patient and/ or require immediate medical attention.

9.2. For results with critical value, laboratory shall informed the requestor for immediate action and shall be documented to whom the result was informed with correct date and time with read back of the result.

9.3. Critical Limits for **Chemical Pathology**

	Adults	Paediatric
Potassium (mmol/L)	<2.8 or >6.0	<2.8 or >6.0
Sodium (mmol/L)	<125 or >155	<125 or >155
Glucose (mmol/L)	<2.8 or >20	<2.8 or >20
Bilirubin (umol/L)	-	> 300
Calcium (mmol/L)	<1.5 or >3.0	<1.7 or >3.1
Magnesium (mmol/L)	<0.41 or >2.0	<0.5 or >1.8
Phosphate (mmol/L)	<0.32 or >2.87	<0.4 or >2.8
Lactate (mmol/L)	>5.0	>5.0
CSF Glucose (mmol/L)	<1.6	<1.6
CSF Protein (g/L)	>1.87	>1.87

9.4. Critical Limits for **Hematology**

	Adults	Paediatric	Neonate
Hemoglobin (g/dL)	<6.0 or >19.0	<7.0 or >20.0	<8.0 or >22.0
Hematocrit (%)	<20 or > 60	<20 or >60	<25 or >70
WBC ($x10^9$/L)	-	<2.0 or >50.0	-
Platelet ($x10^9$/L)	<20 or >1000	<50.0 or >1000	-
INR (Ratio)	>5	>5	-
PT (Sec)	>2.5 upper limit	-	-
APTT (Sec)	80 sec or >2x upper reference range	-	-

9.5. Critical Findings for **Microbiology**

a.	CSF Culture and Sensitivity	: Microscopy result (Normal or abnormal)
b.	CSF Antigen detection	: Positive rapid antigen detection
c.	Blood culture	: Positive result from gram stain or/ and culture
d.	Sterile body fluids	: Positive result from gram stain or culture
e.	Acid Fast Bacilli	: Positive smear result or/ and culture
f.	Malaria Parasite on blood flim	: Presence of malaria parasite
g.	Stool culture	: *Salmonella typhi, Vibrio cholerae, Shigella*
h.	Any type culture	: ESBL prodicer organism, MRSA, MRO, VRE, VRSA
i.	Pernasal swab	: Bordetella Pertussis, Corynebacterium diphteria

9.6. Critical Findings for **Anatomical Pathology**

a.	Unexpected or discrepant findings	:	Unexpected malignancy Wrong organ removed
b.	Reports of infections	:	Bacteria in heart valves or bone marrow Organisms in an immune-compromised patient such as AFB, fungi, viral, protozoa Organisms in CSF Unusual organisms or organism in unsual sites e.g amoeba in the eye
c.	Report on critically ill patients requiring immediate therapy	:	Crescents in greater than 50% of glomeruli in renal biopsy specimen, Transplant rejection
d.	Cases that have immediate clinical consequences	:	Fat in an endometrial curettage Mesothelial cells in a heart biopsy Fat in snare colon biopsy specimens

10. RETENTION OF RECORDS AND SPECIMENS

10.1. Records and/or diagnostic materials are retained for a period of time for the best interest of the patient, which includes permitting additional testing to be performed on the original existing specimen if required and to serve as a form of physical audit trail against possible future litigation and allegations of professional misconduct.

10.2. Our unit's policy in this regard is guided by the National consensus on pathology records and materials guideline year 2022 with the table (Table1-6) below extracted as a guidance for our clients.

Table 1: Applicable to all specialties of pathology unless otherwise specified in the specialty concerned

No	Records / Materials	Retention duration	Method of disposal
1.1	Personnel records	Period of employment + 3 years	Shred
1.2	Quality management records 1.2.1 All QC and QA records 1.2.2 External QA end-of cycle summary 1.2.3 Remedial action log	 3 years 5 years 5 years	Shred
1.3	Equipment management logs 1.3.1 Maintenance, service, repair and calibration records 1.3.2 Daily, weekly, monthly maintenance log 1.3.3 Temperature records	 Lifetime of machine + 1 year 1 year 1 year	Shred
1.4	Discontinued laboratory methods/ procedures(manuals)	1 year after discontinuation	Shred
1.5	Laboratory Management Document/Record 1.5.1 Accidents and incidents reports 1.5.2 Staff training records 1.5.3 Staff competency records 1.5.4 Feedback/ suggestions 1.5.5 Laboratory statistics 1.5.6 Sample receiving records 1.5.7 Duty rosters 1.5.8 Protocols of SOP 1.5.9 Technical procedure manual 1.5.10 Records of inspection 1.5.11 Accreditation documents	 Indefinite Period of employment (including on call) 7 years 7 years 7 years 7 year 7 year Lifetime of SOP in use +1 year Lifetime of SOP in use +1 year 2 accreditation cycles 2 accreditation cycles	Shred
1.6	All records and reports known to have medico-legal implications or individuals without capacity upon receipt of specimen. All records and reports for minors.	Indefinite* Until the child is 25 years of age*	Shred
1.7	All specimen, unless specified otherwise under the specialty concerned	Retain specimens under appropriate storage conditions for 2 days after issue of	Shred

No	Records / Materials	Retention duration	Method of disposal
		report/result	
1.8	Records relevant to diagnostic products or equipment: records on procurement, use, modification and supply.	2 accreditation cycles or duration of use of products or equipment + 1 year.	Shred
1.9	Records of assay validation and verification for the methods used and results obtained.	2 accreditation cycles or duration of use of methods + 1 year.	Shred
1.10	Point-of-care testing 1.10.1 Worksheets/ test record/ log/ data. 1.10.2 Specimens 1.10.3 Strips/ cartridges/ kits etc	 Lifetime of the instrument or test platform + 1 year Discard after issuance of report/ result Discard after issuance of report/ result	Shred

Table 2: Anatomical Pathology: Histopathology

No	Records / Materials	Retention duration	Method of disposal
2.1	Request form (hard copy or electronic equivalent) with written clinical information not transcribed into report or not readily available in the patients' notes.	As long as the corresponding report is kept	Shred
2.2	Final reports (hard copy or electronic equivalent) 2.2.1 Minors 2.2.2 Normal adults 2.2.3 Individuals without capacity	 Until the child is 25 years of age* 10 years* Indefinite*	Shred
2.3	Physical or digital scanned slides 2.3.1 Surgical pathology slides including all permanent stained slides (H&E, frozen section, special stains, immunohistochemistry, chromogenic in-situ hybridisation) 2.3.2 Electron microscopy slides/grids 2.3.3 Fluorochrome stained slides	 7 years 7 years 2 days after issuance of report	Clinical waste
2.4	Blocks 2.4.1 Paraffin-embedded blocks including residual tissue from frozen sections 2.4.2 Resin-embedded blocks, for ultrastructural study 2.4.3 Frozen tissue blocks for special stains/ immunofluorescence studies 2.4.4 Special paediatric cases including paediatric cancers, inherited genetic diseases, etc.	 20 years or until the child is 25 years old (whichever is greater) 20 years or until the child is 25 years old (whichever is greater) 3 months Indefinite	Clinical waste
2.5	Unblocked surgical wet tissues	1 month after	Clinical waste

No	Records / Materials	Retention duration	Method of disposal
		issuance of report	
2.6	Clinical/non-coronial autopsy 2.6.1 Register/consent form/images/gross photographs/ results/reports 2.6.2 Unblocked wet tissues/organs retained during autopsy with consent 2.6.3 Tissue blocks 2.6.4 Slides	10 years 3 months after issuance of report 20 years 7 years	Shred Clinical waste

Table 3: Anatomical Pathology: Cytopathology

No	Records / Materials	Retention duration	Method of disposal
3.1	Request forms (hard copy or electronic equivalent) with written clinical information not transcribed into report or not readily available in the patients' notes	As long as the corresponding report is kept	Shred
3.2	Final reports (hard copy or electronic equivalent) 3.2.1 Minors 3.2.2 Normal adults 3.2.3 Individuals without capacity	Until the child is 25 years of age¥ 10 years* Indefinite¥	Shred
3.3	Exfoliative and fine needle aspiration cytology (FNAC) 3.3.1 Slides 3.3.2 Cell blocks	7 years 20 years	Clinical waste
3.4	Gynae/non-gynae slides	7 years	Clinical waste
3.5	Male fertility slides	1 year	Clinical waste
3.6	Residual specimen of sputum, urine, cerebrospinal fluid, and other body fluids after slides preparation	7 days from date of receipt or until 2 days after the final report is issued (whichever date is later)	Clinical waste
3.7	Specimens received in liquid-based fixative	1 month after issuance of report	Clinical waste
3.8	Digital images used for diagnostic analysis e.g. semi-automated Pap screening images	6 years (to cover at least 1 recall visit)	

¥ applicable only to centre(s) with relevant storage facilities, and only if the status of the patient is known to the laboratory upon reception.

** for laboratory with LIS – in both physical and electronic copies for 5 years and kept in electronic copies only for another 5 years; for laboratory without LIS – in physical copies for 10 years*

Table 4(a) and 4(b): Hematology & Transfusion

a. General Hematology and Hemostasis

No	Records / Materials	Retention duration	Method of disposal
4.1	Request form accompanying specimen 4.1.1 Routine test 4.1.2 Test with interpretive report	 1 month after issue of result 3 years after issue of report	Shred
4.2	Reported blood film (i.e. slide)	1 year after issue of report	Clinical waste
4.3	Blood samples	2 days after the test is done.	Clinical waste
4.4	Bone marrow slides	7 years after issue of report	Clinical waste
4.5	Reports (hard copy/ electronic equivalent) 4.5.1 Bone marrow 4.5.1.1 Haemoglobin analysis 4.5.1.2 Special coagulation test (e.g mixing test) 4.5.2 Full blood picture	 10 years 10 years 10 years 10 years	Shred
4.6	Results (hard copy/ electronic equivalent) 4.6.1 Full blood count 4.6.2 Routine coagulation test (e.g., PT, INR, APTT, disseminated intravascular coagulation) 4.6.3 G6PD screening	 10 years 10 years 10 years	Shred

b. Transfusion

No	Records / Materials	Retention duration	Method of disposal
4.12	Patients' blood specimens for testing	1 week	Clinical waste
4.13	Donors' blood specimens for testing 4.13.1 Negative microbiology result 4.13.2 Positive microbiology result 4.13.3 Blood grouping	 1 day after the test is done 1 week after the test is done 1 week after the test is done	Clinical waste
4.14	Laboratory records of blood products received and issued	20 years	Shred
4.15	Laboratory records for all the immunohematology testing	20 years	Shred
4.16	Donors' record 4.16.1 Permanently deferred donors 4.16.2 Donation date, time, and the	 Indefinitely 1 year	Shred

No	Records / Materials	Retention duration	Method of disposal
	phlebotomist identification 4.16.3 Donation form of blood donor 4.16.4 Laboratory records	7 years 20 years	
4.17	Investigations and reports related to the safety of blood components	10 years	Shred
4.18	Records of recall and look-back/trace-back	10 years	Shred
4.19	Final reports (hard copy or electronic equivalent) 4.19.1 Minors 4.19.2 Normal adults 4.19.3 Individuals without capacity	Until the child is 25 years of age¥ 10 years Indefinite¥	Shred

¥ *applicable only to centre(s) with relevant storage facilities, and only if the status of the patient is known to the laboratory upon reception.*

Table 5: Chemical Pathology

No	Records / Materials	Retention duration	Method of disposal
5.1	Request form (hard copy or electronic equivalent)	1 year following report validation	Shred
5.2	*Report duplicates: 5.2.1 Neonatal screening and inborn error of metabolism 5.2.2 Drug of abuse testing (confirmatory or screening) 5.2.3 All other reports	 25 years 7 years 7 years	Shred
5.3	Results (hard copy or electronic equivalent)	1 year	Shred
5.4	5.4.1 Serum, plasma, blood, frozen urine, and other frozen body fluids 5.4.2 Urine and faeces 5.4.3 Other body fluids (e.g. cerebrospinal fluid, pleural fluid), aspirates, and swabs 5.4.4 Urine toxicology	**2 days after issuance of report/result Discard after issuance of report/result 24 hours after the test is done 5 days after issuance of report/result	Clinical waste
5.5	Final reports/records/accompanied images/representative diagrams/photographs	1 year provided all results have been transcribed into a formal report	Shred
5.6	Protein electrophoresis (electrophoretogram/gel) and immunofixation/immunotyping (gel/digital)	3 years	Clinical waste
5.7	Specimens for biochemical testing for inherited metabolic disorders 5.7.1 Dried blood spot 5.7.2 Serum/plasma/urine/cerebrospinal fluid	 1 year 3 months after issuance of report/result	Clinical waste

**Report duplicates: copy of original report or ability to reprint information content of an original report.5*

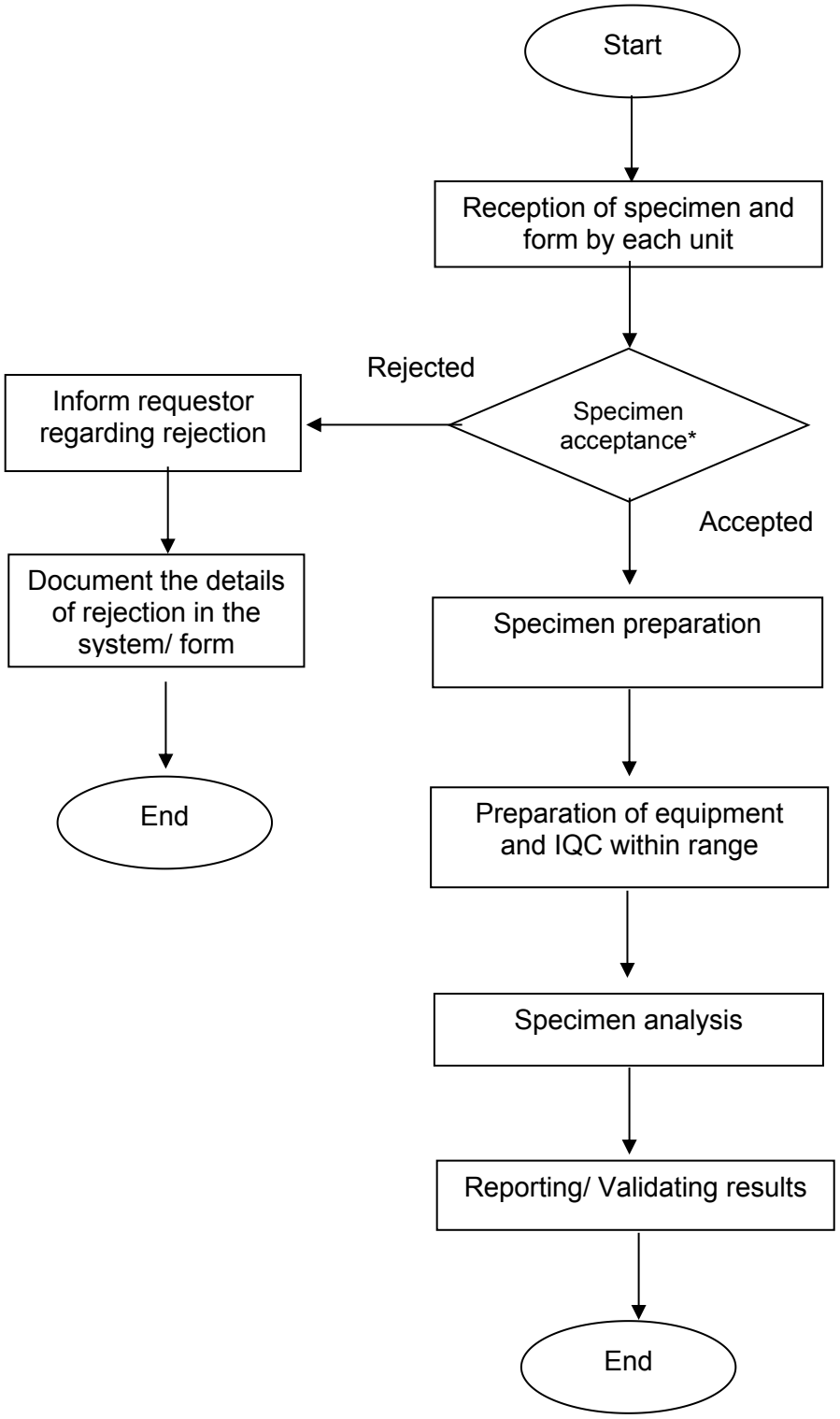
***2 days after issue of report/result unless additional testing is required i.e. if the final report recommends follow-up analysis done in parallel with re-analysis of the original sample.*

Table 6: Medical Microbiology

No	Records / Materials	Retention duration	Method of disposal
6.1	Request form 6.1.1 Hard copy form 6.1.2 Electronic form 6.1.3 Request form used as laboratory worksheet	 1 month after issuance of report/result 1 year Retain as part of laboratory worksheet	Shred
6.2	Worksheets 6.2.1 For permanent/semi-permanent specimens 6.2.2 For temporary specimens (such as serum, body fluid, and faecal samples) 6.2.3 Instrument print-out, graphic outputs, and digital images used for diagnostic analysis 6.2.4 Instrument output for diagnostic tests using nucleic acids	 At least 1 month after issuance of report/result At least 1 month after issuance of report/result 1 year for annual analysis 1 year for annual analysis	Shred
6.3	Final report or copies (hard copy or electronic equivalent)	6 months or as needed	Shred
6.4	Specimens for microbiological investigations 6.4.1 All specimens except urine, and blood culture 6.4.2 Urine 6.4.3 Blood culture, including fungal/ mycobacterial culture Negative: Positive:	 2 days after issuance of report/result Discard after issuance of report/result Discard after issuance of report/result 7 days after issuance of report/result or blood culture positive	Clinical waste
6.5	Microbiological cultures 6.5.1 Positive cultures including viral cultures 6.5.2 Positive cultures of clinical importance (e.g. blood culture isolates, cerebrospinal fluid isolates, enteric pathogens, with multiple or methicillin-resistant *Staph. aureus,* 'outbreak' strains, *M.tuberculosis*, Group A Streptococci, and unusual pathogens of clinical significance) 6.5.3 Isolates have been referred to reference laboratories	 2 days after issuance of report/result Should be retained for at least 7 days Until receipt of the reference laboratory's final report	Clinical waste

6.6	Freeze-dried or other permanently preserved cultures	Retained as needed	Clinical waste
6.7	Slides 6.7.1 Wet preparation 6.7.2 Permanently stained slides 6.7.2.1 From clinical specimens (e.g. cerebrospinal fluid preparations, blood films for malarial parasites, blood culture films,acid-fast bacilli) 6.7.2.2 From culture plates 6.7.3 Immunofluorescence slides	 Discard after issuance of report/result Negative: discard after issuance of report/result (unless negative slides are required for re-checking or EQA). Positive: 2 days after issuance of report/ result 2 days after issuance of report/result 2 days after issuance of report/result	Clinical waste
6.8	Electrophoretic strips and immunofixation plates	2 years (either strips/plates or digital images)	Clinical waste
6.9	Serum/plasma for serology/immunology 6.9.1 Negative result 6.9.2 Positive result	 Discard after issuance of report/result 7 days after issuance of report/result	Clinical waste
6.10	Nucleic acids (DNA and RNA) 6.10.1 Extracted from clinical samples or derived from microbiological cultures, and the molecular diagnostic outputs from microbiology/virology laboratories - Negative - Positive 7.10.2 Original specimen remaining after nucleic acid extraction	 Discard after issuance of report/result 7 days after issuance of report/result Discard 2 days after the final report has been issued by the laboratory	Clinical waste

11. GENERAL WORKFLOW OF SPECIMEN HANDLING IN PATHOLOGY DEPARTMENT, HOSPITAL TELUK INTAN



**Specimen acceptance is based on Specimen Rejection Criteria*

INTEGRATED LABORATORY

(HEMATOLOGY AND CHEMICAL PATHOLOGY)

12. INTEGRATED LABORATORY (HEMATOLOGY AND CHEMICAL PATHOLOGY)

12.1. Introduction

The Integrated Unit operates an all year-round service providing diagnostic and consultation services encompassing analysis and interpretation of biochemical changes in various body fluids for screening, diagnosis, monitoring as well as prognosis of diseases. It comprises two main sections, the Chemical Pathology and Hematology Section. List of tests offered and specimen requirements is described in the tests list section. The Integrated Unit operates 24 hours daily including the weekends and public holidays. We also cater to other government hospitals and local clinics for selected tests.

Tests performed are strictly monitored by both internal as well as external quality assurance programs. Each report issued to our clients are reviewed technically and clinically by our team consisting of Pathologists, Medical Officers, Scientific Officers and Medical Laboratory Technologist depending on the complexity of the test with accompanying comments or interpretation where appropriate.

We also provide expertise to advise users concerning the selection and installation of laboratory related instruments for point of care testing (POCT). Its quality assurance programs are monitored regularly and enforced through the Hospital POCT Committee.

Our unit also participates actively in teaching and education with frequent acceptance of trainees in various categories of laboratory related profession as well as organization of lectures and seminars.

12.2. Diagnostic Services

Samples for Integrated Unit will be received at the Main Pathology Counter or by pneumatic tube. These samples will be sorted based on test requests and processed accordingly. The diagnostic services are divided into:

A. Urgent Tests

These tests are for **EMERGENCY TESTING ONLY** and need to be specified in the request form. The test applied will be given priority in the process of analyzing and producing of test results within short turnaround time (TAT). The test can be requested during and after office hours.

For urgent immunoassay and full blood picture request, arrangement should be made by contacting Pathologist or Medical Officer in-charge.

The following lists are tests which can be requested as urgent:

Chemical Pathology	**Hematology**
Chemistry Renal Profile Serum electrolytes: Sodium, Potassium, Chloride, Calcium, Magnesium, Phosphate Serum and Urine Amylase Arterial Blood Gas Plasma Ammonia Plasma Lactate Plasma Glucose CSF Biochemistry Urine Biochemistry Urine BhCG (UPT) **Immunoassay** High sensitivity Troponin I Thyroid Function Test Serum BhCG **Toxicology** Serum Acetaminophen Urine Paraquat	Full Blood Count (FBC) Coagulation Profile (PT/ aPTT/ INR) Dimer Full Blood Picture (FBP)

B. Routine Tests

The tests ordered not specifically request as urgent. The test will be processed with routine turnaround time (TAT). The test can be requested during and after office hours.

12.3. Specimen Collection

Tests are performed using serum, plasma and whole blood samples. Proper collection is essential to provide accurate results for patient management and care. The quality of specimen provided will determine the quality, reliability and accuracy of the laboratory result.

For collection of specimens, minimum tourniquet pressure should be applied during venipuncture in order to avoid forcing of free fluid from capillaries which may result in hemoconcentration and spurious elevations of protein and protein bound substance e.g.: total protein, calcium. If possible, tourniquet should be release after no more than 1 minute from the initial placement.

Hemolysis can affect clinical chemistry test by interfering with the photometric determination of the analyte concentration in the sample leading to erroneous results. If considerable hemolysis is noted, another sample will be requested upon rejection of the first sample.

Avoid mixing or transferring blood from different tubes as certain tubes may contain anticoagulant substance which will falsely elevated the concentration of certain analyte in the sample.

Avoid collection of blood from limbs being infused with intravenous solution. This will lead to hemodilution and measurements on these sample produces erroneous results which is not the actual presentation of the analyte concentration in the specimen.

12.4. Test Instructions and Collection Procedures

Hematology

Guidelines for sampling, handling and processing coagulation samples. Pre-analytical errors account for the majority of errors in the haemostasis laboratory and it is essential that they are well understood and minimised .To produce accurate and meaningful results and increase quality and standardization within haemostasis laboratories, correct procedures must be followed (Table I).

Pre-analytical stage	Recommendations
Blood collection	- Perform clean venepuncture with minimal stasis - Use 21 gauge needle (18 gauge may be used in adults with good veins, 23 gauge maybe used in infants). - Do not use heparin-contaminated venous lines. Where this is unavoidable because of poor venous access, flush the line with saline and discard initial draw. - Use 3.2 % sodium citrate tube. Ratio of anticoagulant to blood (1 volume : 9 volumes). - Ensure the coagulation tube is within shelf-life. - Ensure correct order of draw.(generally coagulation sample should be initial draw). - Ensure appropriate filling of tube to manufacturer's recommended mark. - Gentle inversions 3-4 times.
Sample handling	- Whole blood transported to laboratory immediately within 1 hour - Samples examined for clotting and correct fill prior analysis. - Immediate centrifugation and analysis where possible.
Storage and preparation	- Most test should be analysed within 4 hours of sampling. - Frozen plasma should be stored below -24 degrees (for 3 months) and -70 degrees for longer periods. - Plasma samples to reference laboratory should be sent frozen

Reference:
Baker, P., Platton, S., Gibson, C., Gray, E., Jennings, I., Murphy, P., Laffan, M. and (2020), Guidelines on the laboratory aspects of assays used in haemostasis and thrombosis. Br. J. Haematol., 191: 347-362.

Chemical Pathology

Most of tests in Chemical Pathology require serum sample that need to be collected in plain tube. Special requirements for certain tests are discussed below.

a. Arterial Blood Gas
   - **i.** Use 1 ml disposable **heparinized syringe**
   - ii. Draw 1 ml of arterial blood
   - iii. Remove all air bubbles inside the syringe
   - iv. Discard the needle to prevent needlestick injury
   - v. Recap with special stopper to avoid specimen exposure to air
   - vi. Mix well by rolling the syringe between palms to prevent clotting
   - vii. Transport the syringe immediately to the laboratory in an ice slurry
   - viii. Specimen must be labeled and accompanied by a complete request form

b. Ammonia
   - i. Please notify the laboratory before sample collection for analyzer preparation
   - ii. Venous specimen is best drawn without a tourniquet or immediately after the tourniquet has been applied briefly
   - iii. Ideally, the patient should not in distress, as difficult venipuncture can cause a spurious increase in ammonia concentration
   - iv. Send blood in **EDTA tube** in ice box to maintain the cold chain immediately to the laboratory so that it can be centrifuged within 15 minutes.
   - v. Plasma obtained will be separated and analyzed immediately as ammonia only stable for 2 hours in 2-8^{o}C
   - vi. Exogenous sources of ammonia, e.g. smoking will falsely elevate the ammonia level.

c. Lactate
   - i. Patient should be fasting and at complete rest for at least 2 hours to allow the blood lactate concentration to stabilize.
   - ii. Patients should avoid exercise of the hand or arm before and during the collection of blood.
   - iii. Venous specimens should be obtained without the use of a tourniquet because venous stasis will increase lactate levels. If a tourniquet must be used, the blood should be drawn immediately after the tourniquet is applied.
   - iv. Blood cells continue to metabolize glucose following collection, resulting in the production of lactic acid. For this reason, a **grey-top tube containing sodium fluoride**, which inhibits glycolysis, is usually recommended for plasma lactate sample collection.
   - v. Send sample chilled in ice slurry to the laboratory immediately to further inhibit glycolysis and lactic acid formation.
   - vi. Plasma lactate concentration can be falsely increased if the plasma is not separated from the cells shortly after sample collection (Centrifugation and separation of plasma from cells is recommended within 15 minutes of collection).
   - vii. Sample stability after separation from cells; 3 days in 2-8^{o}C

d. Random Urine/ Body Fluid Sample

i. For urine, early morning urine is preferred for testing. Catch mid-stream urine using 60 mL **sterile container** during emptying of the bladder.
ii. Send specimen immediately to laboratory; never send sample through pneumatic tube system.
iii. Please send urine/ body fluid sample to the laboratory as soon as possible as sample collected more than 2 hours will affect result reliability. If delayed analysis (>2 hour), urine sample need to be refrigerated.

e. 24-hours Urine Sample
i. Determine the type of qualitative assays planned to be performed on the collected specimens**.** This is important to determine whether preservative is required. The special container is available at laboratory upon request.
ii. For urine collection without preservative, the normal **24-hours urine container** may be used. When specimens are to be collected over a specified period of time, the patient's close adherence to instructions is important.
iii. On the day of the collection, discard the first morning urine void, and begin the collection
iv. After this void. Collect all urine for the next 24 hours so that the morning urine void on the second day is the final collection.
v. Urine should be passed into a separate container at each voiding and then emptied into a larger container for the complete specimen. This two-step procedure prevents the danger of patient splashing himself/herself with the preservative (e.g., acid) in the container.
vi. Store the bottle at room temperature or in the refrigerator.
vii. If patient needs to have a bowel movement, any urine passed with the bowel movement should be collected. Try not to include feces with the urine collection. If feces do get mixed in, do not try to remove the feces from the urine collection bottle.
viii. After the collection period has been completed, label the container appropriately and, state the collection date and time. Send the collected urine to laboratory immediately for processing.

f. CSF Biochemistry and Microscopy
i. Tests include Total Protein, Globulin, Glucose and Chloride.
ii. Specimen should be collected in a sterile manner and placed in a **Bijou bottle.**
iii. Collect minimum of 3-5 mL of specimen.
iv. If glucose and protein tests are requested, serum levels should be requested at the same time.
v. The normal CSF glucose is about 60% compared to serum level.
vi. Do not refrigerate specimens. Send specimen immediately to laboratory. Never keep CSF specimen as specimen collected more than 1 hour as it will affect result integrity. Specimens more than 1 hour will be processed but the results may be erroneous due to a delay in transit/processing.
vii. A delay in examining CSF falsely low glucose value due to glycolysis.
viii. Other body fluids that require certain biochemical test should be informed and discussed with the Scientific Officers / Chemical Pathologist prior to sending.
ix.

g. Hemoglobin A1c (HbA1c)
   i. HbA1c testing require whole blood sample that need to collected in **EDTA tube** with appropriate amount.
   ii. Request less than 3 months from previous report with be rejected.

h. Urine for Drug of Abuse (Medicolegal cases including medical check-up)
   i. Sample collection must follow the guidelines as in the *'Pekeliling Ketua Pengarah Kesihatan Bil 1/2021: Garis Panduan bagi Pengesanan Penyalahgunaan Dadah Dalam Air Kencing Versi 2.0'* as below: -

      A. Sample collection must be properly supervised.
      B. Laboratory personnel shall not be involved in the sample collection.
      C. Collection site must have suitable toilet facilities and are free from soap, dispenser or cleaning agent.
      D. The urine volume should be at least 30 ml in **universal container**
      E. The person supervising the collecting should stand close enough to the patient/suspect to see that the urine specimen is genuinely passed out by the person and there is no attempt to falsify or adulterate the specimen.
      F. The urine bottle must be securely capped and sealed with sealing wax.
      G. Bottle must be labeled in front of the patient/suspect with the following information:
         I. Patient's full name
         II. Full identity card number
         III. Date and time of specimen collection
         IV. Signature of Supervising Officer
         V. Drug(s) suspected
      H. Proper Chain of Custody procedures for urine collection shall be maintained.
      I. Donor shall not be permitted to transport samples to the laboratory.

12.5. Uncertainty of Measurements (MU)

Quantitative Hematological and Biochemical tests are subjected to a degree of uncertainty in their measurement. This may be due to a variety of factors mainly:

- Pre-analytical factors
- Physiological variation within biological subjects (CV_i)
- Analytical measurements imprecision (CV_a)

Kindly contact the Chemical Pathology Unit for further information regarding the uncertainty of measurement for the tests performed in our laboratory if in doubt regarding whether the change in patient's result is significant or not.

MICROBIOLOGY LABORATORY

13. MICROBIOLOGY LABORATORY

13.1. INTRODUCTION

The Microbiology Laboratory provides a comprehensive service for Bacteriology, Virology, Parasitology, Mycology, Serology, Molecular and Infection Control. Clinical advice is available from Medical Microbiologists.

This handbook outlines all the information requires to use the service as laboratory efficiency depends to a large extent on user co-operation. User compliance with a few rules concerning safety, specimen identification and transport will greatly help the laboratory to deliver the service needed by Users. Please feel free to contact the laboratory to discuss any problems or issues that may arise.

13.2. SERVICE HOURS

Bacteriology laboratory: 24 hours including weekends and public holidays
Serology laboratory: 8 am to 5pm; close on weekends and public holidays

Urgent requests should be restricted to those occasions where the results are essential for the immediate management of the patient. Please contact Medical Microbiologist for the request of urgent testing.

13.3. CONSENT

It is the responsibility of the requesting doctor to obtain consent for specimen collection and the tests requested. The laboratory assumes that informed consent for testing to be carried out has been given at the time of the request form has been completed. Consent for specific research shall be regulated separately by the ethics committee.

13.4. LIST OF SERVICES

Microbiology Unit provides the following services:

Diagnostic microbiological services provided by bacteriology and serology laboratories.

The Microbiology laboratory Diagnostic Services offered are as follows:

- Direct detection of bacteria, fungi and parasites in clinical specimens by microscopic examination of stained or unstained smear.
- Isolation, identification and sensitivity testing of significant isolates of bacteria.
- Isolation and identification of fungi
- Utilisation of immunological methods for antibody or antigen detection
- Viral genome detection using nucleic acid testing by automated rapid molecular method
- Participation in hospital wide infection and antibiotic stewardship activities related to surveillance, control and prevention of healthcare –associated infections
- Provision of microbiologic studies of the hospital environment and sterility testing for prevention and control of infection
- Consultative services to clinicians and other health care providers, contribution to development of relevant policy, clinical care guidelines and hospital infection and antibiotic control related documentation or activity
- Training for technical, scientific and undergraduate's laboratory and medical personnel

13.5. REQUEST FORM

All tested specimens must be accompanied with designated test request form. For test that is offered in Hospital Teluk Intan, the designated test request form is the PER-PAT 301 form.

For test that is referred to other referral centers, to follow the designated form as requested by the referral centers (To refer test list for referred test)

The form must be filled legibly and completely with the following information:

Patient's details: Name, Identity Card Number, Gender, Age, Clinic/ Ward/ Hospital name

For medicolegal reasons, if patients name or unique identification is not confirmed, to use UNKNOWN with Hospital registration number.

Patient's Clinical and Test details: Relevant clinical information pertaining to the requested test, diagnosis and test required, type of sample, date and time of sampling.

For culture request, important information is antimicrobial treatment already given or planned for patient management. For non-culture request, it is important to document relevant risk factors and diagnosis onset to guide appropriate test done.

Requesting doctor's details: Name, official stamp and signature

13.6. SPECIMEN COLLECTION AND HANDLING

1. General consideration for specimen collection for Microbiology investigations:
2. Sample collection particularly blood culture, should be collected prior starting antibiotic therapy, if possible. If antibiotic has been started, write the details of the antibiotic therapy in the request form.
3. Aseptic technique must be applied in collection of all specimens
4. Collect specimen from the source of infection with minimal contamination from adjacent tissues, organs or secretions.
5. Collect specimen at optimal times. For example, early morning sputum for AFB direct smear and culture and do blood filarial smear at night to coincide with the appearance of the microfilariae.
6. Use proper container and/or transport medium as recommended.
7. Properly label the specimen and complete test request form. The specific source of specimen is required. For example: Right and left eye/ ear swab, endocervical swab/ high vaginal swab, blood culture from catheters/ peripheral blood culture.
8. Deliver specimen promptly. If there is a delay of more than 2 hours after collection, specimen may be sent in transport medium.
9. It is the responsibility of the requesting clinician to complete the correct request form fully. Errors or incomplete information WILL result in the delay in specimen processing and reporting
10. General consideration for specimen collection for Microbiology investigations:
11. Sample collection particularly blood culture, should be collected prior starting antibiotic therapy, if possible. If antibiotic has been started, write the details of the antibiotic therapy in the request form.
12. Aseptic technique must be applied in collection of all specimens

13. Collect specimen from the source of infection with minimal contamination from adjacent tissues, organs or secretions.
14. Collect specimen at optimal times. For example, early morning sputum for AFB direct smear and culture and do blood filarial smear at night to coincide with the appearance of the microfilariae.
15. Use proper container and/or transport medium as recommended.
16. Properly label the specimen and complete test request form. The specific source of specimen is required. For example: Right and left eye/ ear swab, endocervical swab/ high vaginal swab, blood culture from catheters/ peripheral blood culture.
17. Deliver specimen promptly. If there is a delay of more than 2 hours after collection, specimen may be sent in transport medium.
18. General consideration for specimen collection for Microbiology investigations:
19. Sample collection particularly blood culture, should be collected prior starting antibiotic therapy, if possible. If antibiotic has been started, write the details of the antibiotic therapy in the request form.
20. Aseptic technique must be applied in collection of all specimens
21. Collect specimen from the source of infection with minimal contamination from adjacent tissues, organs or secretions.
22. Collect specimen at optimal times. For example, early morning sputum for AFB direct smear and culture and do blood filarial smear at night to coincide with the appearance of the microfilariae.
23. Use proper container and/or transport medium as recommended.
24. Properly label the specimen and complete test request form. The specific source of specimen is required. For example: Right and left eye/ ear swab, endocervical swab/ high vaginal swab, blood culture from catheters/ peripheral blood culture.
25. Deliver specimen promptly. If there is a delay of more than 2 hours after collection, specimen may be sent in transport medium.
26. It is the responsibility of the requesting clinician to complete the correct request form fully. Errors or incomplete information WILL result in the delay in specimen processing and reporting

13.7. SAMPELS REQUIRING TRIPLE LAYER PACKAGING

Specimens from patients suspected or proven to have the following infections:

- Respiratory samples for COVID 19 infection
- Respiratory samples from all patients who have fever and have recently returned from Middle East Countries and Countries with Mers CoV infection
- Upper respiratory tract specimens, blood cultures, CSF and samples from skin lesions from patients with suspected or proven meningococcal infection (until 24h after commencing antibiotic therapy).
- Other specimens as directed by the Infection Control Team.

13.8. SPECIMEN COLLECTION GUIDELINES BY SPECIMEN

A. Blood Culture (Blood Culture Bottles)

A successful blood culture is determined by maximum number of significant positive culture and the earliest time to detection of positive cultures. A

continuous monitoring automated blood culture system is used in the department of Microbiology. The system detects the presence of aerobic and anaerobic bacteria, and fungi by measurement of CO2 generated in a specially formulated culture medium. Therefore, proper blood collection technique is needed to obtain optimal quality result.

Blood Volume Required

Type of specimen bottle	Volume (ml)
Adult	8-10
Paediatric	1-3
Myco F/Lytic	5-10

Note: Underfilling of bottles reduces the sensitivity of the blood culture and overfilling of bottles may cause false positivity

Timing of Blood Culture Collection

1) Ideally, before administration of antimicrobial agents.
2) Draw blood culture as close as possible to the episode of chills or fever
3) Blood culture from the catheter should be taken simultaneously with the peripheral blood culture in case to rule out catheter related blood stream infection (CRBSI)

Site of Blood Culture Collection

1. Peripheral- the preferable blood culture collection site.
2. Intravenous catheter
Only when catheter related bloodstream infection is suspected.
A peripheral blood culture must be taken simultaneously and send to the lab in paired sample.
3. Do not use existing peripheral lines/cannula to obtain blood cultures.

Collection Procedure

Blood culture must be collected using aseptic technique.
Check the blood culture vials for:
Expiry date
Turbidity of the broth inside the vial.
Note: Expired blood culture bottle with gross turbidity should be returned to lab.

i. Select the site of venipuncture
ii. Remove the plastic flip-off caps from the vials immediately before
iii. collecting the sample and clean the rubber septum on top of the bottle with 70% alcohol.
iv. Perform hand hygiene and put on sterile PPE.

v. Skin preparation:
   - Cleanse the venipuncture site with 70% isoprophyl alcohol
   - Swab concentrically outwards with 2% Chlohexidine gluconate in 70% alcohol starting at the point of venipuncture
   - Allow the site to air dry

vi. Perform venipuncture. Distribute blood into vials as recommended.
vii. Invert the bottle gently for a few times and keep the bottle upright.
viii. Label all the vials with:
ix. Patient's name and identification number
x. Date, time and source of collection
xi. Do not write on or place any labels over the vial barcode, as this is used by the instrument to process the specimen.
xii. Transport to lab as soon as possible for incubation. If not, keep at room temperature for not more than 48 hours

Additional notes:

1. Blood cultures aerobe, anaerobe and paediatrics bottles are incubated for 5 days.
2. If endocarditis is suspected, 3 sets of blood cultures are recommended.
3. Please call bacteriology lab if prolonged incubation is required.
4. For positive culture, gram stain results will be notified to respective requester
5. by ward as written in the request form. The preliminary result will be generated
6. in the LIS for reference.
7. For the MycoF/lytic bottle, the blood will be incubated for 21 to 42 days.
8. Positive TB culture will be sent to Makmal Kesihatan Awam Ipoh for
9. TB culture as referred sample.
10. For colonies with difficult identification, the colonies will be referred to a referral laboratory for confirmation of identification and antibiotics susceptibility testing accordingly.
11. For yeast and mold colonies, the colonies will be referred to a referral laboratory for confirmation of identification and antifungal susceptibility testing accordingly
12. For surveillance purposes, colonies with Multidrug Resistant Organism will be sent to National Health Institute (NIH), Institute Medical Research (IMR).

B. Cerebrospinal Fluids (CSF)

i. Disinfect the skin over the lumbar puncture site and use aseptic techniques to perform a lumbar puncture.
ii. Collect about 1-2 ml of CSF in a sterile container.
iii. Send the specimen at room temperature immediately to the laboratory. Do not store in the refrigerator as organisms causing meningitis are usually very sensitive to cold.
iv. Label the sample properly
v. For a referred test, please fulfilled the appropriate form and requirement. Please refer to the list of referred tests for reference

C. Body fluids culture

i. Disinfect the skin and perform sampling as a sterile procedure
ii. Transfer 5-10ml body fluids, for example pleural, pericardial, peritoneal, and synovial fluids aspirated aseptically to a sterile screw-capped bottle and send them to the laboratory without delay.
iii. If the delay is unavoidable, store at room temperature and send to the laboratory within 24 hours after collection.
iv. Label the sample properly
v. For a referred test, please fulfilled the appropriate form and requirement. Please refer to the list of preferred tests for reference.

D. Ear Swab Culture

i. The external meatus is cleaned with a dry swab moistened with sterile saline. Let the site dry before sampling.
ii. Pass a sterile swab gently into the external canal and collect the exudate. One sterile swab is for one ear.
iii. Place the swab in Amies transport media and send the specimen to the laboratory as soon as possible. Please label the right or/and left ear.
iv. If suspected fungal infection, please mention it in the request form and order it as fungal culture.

E. Eye Swab Culture

i. Collect the eye exudates with sterile swabs. One sterile swab is for one eye. Please label the right or/ and left eye.
ii. Place the swab into a transport medium
iii. Send the specimen to the laboratory at ambient temperature

Additional notes:

For suspected Neisseria gonorrhoea infection, please use a swab with charcoal media. To order as Swab for Neisseria gonorrhoea.
If suspected fungal infection, please mentioned in the request form as fungal culture

F. Corneal Scrapping Culture

i. Clean the skin around the eye with sterile water
ii. Collect multiple corneal scrapings and inoculate on blood agar media, MacConkey agar media, Choc Agar media, SDA Agar, BHIA agar and mycosel agar.
iii. Transport at ambient temperature to the laboratory immediately.
iv. If suspected fungal infection, please mentioned in the request form as fungal culture

G. Stool Culture

i. Using a sterile swab, collect a small amount of stool, by dipping and rotating in the faeces, taking care to include materials containing pus, mucus, or blood if present.
ii. Place the swab with the stool into a Cary-Blair medium and send it to the lab immediately.
iii. If a delay is unavoidable, store at 4 °C in the respective ward and send it to the laboratory within 24 hours after collection.
iv. Additional notes:
v. Fresh stool sample will be rejected. Cary-Blair is the medium of choice for the transport and preservation of *Vibrio cholera*.
vi. Send sample to laboratory as soon as possible to increase yield and reduce contamination

H. Rectal Swab for screening of Carbapenem Resistant Enterobacterales (CRE)

i. Insert a sterile swab deep into the anus 1 inch beyond the anus sphincter so that the swab may come into contact with some faecal material. A satisfactory rectal swab shows some faecal staining.
ii. Dip the rectal swab into Amies transport media and send it to the microbiology laboratory as soon as possible.

I. Sputum culture (Expectorate)

i. Early morning sputum specimen is recommended.
ii. Ask the patient to rinse and gargle the mouth with water.
iii. Instruct the patient to take a deep breath and cough deeply to produce a lower respiratory specimen and collect sputum in a sterile container.
iv. Send the specimen immediately to the laboratory.

J. Nasal Swab culture

i. Moistened the sterile swab with sterile saline before sampling. Rotate the swab over the mucosa of the nasal cavity.
ii. Insert the swab into Amies Transport Media and send the specimen to the laboratory immediately.

K. Throat Swab culture

i. Insert the sterile swab carefully through the mouth with the tongue depressed.
ii. Rub swab over each tonsillar area and the posterior pharynx. Any area with exudates should be sampled. Lift the edge of the membrane and swab under it.
iii. Do not allow swab to touch the tongue or lips.
iv. Insert the swab into Amies Transport Media and send it to the laboratory immediately.
v. Please call the bacteriology laboratory and inform if Corynebacterium diphteriae is suspected.
vi. If Corynebacterium diphteriae is suspected, the sample will be sent to HRPB for identification and antibiotic susceptibility.

L. Tracheal Aspirate, Bronchoalveolar Lavage (BAL) and Bronchial Washings culture

i. Place 1-5ml of the aspirate or bronchial washing in a sterile container. Send to the laboratory immediately.
ii. If delay is unavoidable, store the specimen in the refrigerator for not more than 24 hours.

M. Urine Culture

- Midstream urine collection

  This is the preferred type of urine specimen because of the reduced incidence of cellular and microbial contamination. The procedure significantly reduces the opportunities for contaminants to enter into the urine stream.

- Instruction for female patients to collect midstream urine
  i. Wash hands thoroughly with soap and water.
  ii. Spread labia, with one hand, and keep them continuously apart.
  iii. Take the open sterile cup in the other hand without touching the rim or inner surface of the cup or lid.
  iv. Void 20 to 25 ml into the toilet and catch a portion of the rest of the urine in the container without stopping the stream.
  v. Do not touch the legs, vulva, or clothing with the cup.
  vi. Place the lid on the cup securely.
  vii. Immediately send the specimen to the lab.

- Instructions for male patients to collect midstream urine
  i. Wash hands.
  ii. Retract the foreskin completely.
  iii. Void 20 to 25 ml into the toilet and catch a portion of the remaining urine in the cup without stopping the stream.
  iv. Do not touch the cup with the penis.
  v. Place the lid on the cup securely.
  vi. Immediately send the specimen to the lab.

- Indwelling catheter urine

  i. Do not collect urine from the drainage bag because the growth of bacteria outside the catheter may have occurred at this site.
  ii. Clean the catheter port with an alcohol pad.
  iii. Use a sterile needle and syringe to puncture the catheter port.
  iv. Aspirate the urine directly from the catheter port.
  v. Transfer 20-25ml of urine to a sterile specimen container.

- Suprapubic aspirates (SPA)

  i. To check for the palpable urinary bladder.
  ii. Aseptically using a syringe and needle, aspirates 20-25ml urine directly from the urinary bladder in the midline above the pubic ramus.
  iii. Transfer the urine to a sterile specimen container. Place the lid on the cup securely.
  iv. Immediately send the specimen to the lab.

- Note:

  i. Urine catheter tip cultures are not acceptable.
  ii. In-out catheter sampling method can be used to collect urine samples if the patient is not planned for catheter insertion however the patient is not able to produce urine.
  iii. Clean catch urine or bag urine sample collection is performed particularly in neonates and infants. Please ensure the sterility of the procedure as contamination may occur.
  iv. All urine samples must be sent to the laboratory as soon as possible (must reach the laboratory in less than 2 hours).
  v. In conditions where the urine culture would not reach the laboratory within 2 hours, the sample shall be kept at 2-8 °C and transported in ice or should be collected in a sterile container with boric acid as a preservative.

N. Tissue culture

i. Tissue collection is an invasive procedure and requires surgery by a trained physician.
ii. Collect tissue aseptically and include material from both centres and the edge of the lesion.
iii. Place the specimen in a sterile container.
iv. Do not add any fluid or formalin.
v. Send immediately to the lab.

O. For open wounds:

i. Clean the sinus tract opening of the wound surface mechanically, without using a germicidal agent, to remove the superficial flora as much as possible.
ii. Attempt to culture the base or edges of the wound to avoid collecting “normal flora” organisms.
iii. The following are preferred specimens for sinus tracts:
iv. Aspiration material obtained by needle or catheterization.
v. Curetting from the lining of the sinus tract.
vi. Swab specimens of sinus tracts are acceptable only if the above cannot be obtained.
vii. Note: Swabs of sinus tracts may not accurately reflect the underlying disease process.

Note: Do not submit cultures of superficial lesions for anaerobic culture.
Biopsy of the advancing margin of the wound is the preferred specimen for anaerobes, mycobacteria and fungi.

P. Collection of Pus Aspirate culture

i. Clean the skin over the inflamed area by wiping with sterile saline or 70% alcohol.
ii. With a sterile syringe, aspirate the pus or exudate and transfer the pus into a sterile container.
iii. Send the specimen immediately to the laboratory.

- Additional info

Tissue or aspirate is always superior to swab specimen. If swab must be used, put the swab deep into the lesion and preserve it in Stuart's or Amies Transport medium.

Q. Genital tract culture

Endo-cervical Swab

i. Under direct vision, gently compress the cervix with the blades of the speculum and use the rotating motion with a swab to obtain exudates from the endo-cervical canal.
ii. Inoculate the swab into Charcoal Transport Medium.

Note: Endo-cervical swabs should be taken for the culture of gonococci. HVS is not a suitable specimen for gonococci isolation.

High Vaginal Swab (HVS)

i. Wipe away excess amount of secretion/ discharge.
ii. Obtain secretion from the mucosal membrane of the vaginal vault with a sterile swab into Charcoal Transport Medium and send the swab to the lab in transport media.

Note: For intrauterine devices, place the entire device into a sterile container and send it to the lab at room temperature.

Urethral Swab (Male)

i. Wipe the urethra with sterile gauze or swab.
ii. Collect the exudates with a sterile swab and inoculate them into Charcoal Transport medium.
iii. If a 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 a Charcoal Transport medium.

13.9 SPECIMEN COLLECTION FOR SEROLOGICAL EXAMINATION

General Guidelines

i. Specimens collected should be of adequate volume and in appropriate containers.
ii. Blood collected in plain tube should be allowed to clot by standing undisturbed at room temperature.
iii. Each specimen should be accompanied by COMPLETED PER-PAT 301 request form including clinical summary and diagnosis and to make sure signed by physician in charged if mandated by referral laboratory.
iv. For clinics and district hospital, the serum must be separated in a sterile screw-capped container to avoid hemolysis. The specimen must be sent to the Serology lab as soon as possible. If there is any delay, the serum must be kept at 2-8 °C.

13.10 NEEDLE STICK/ SPLASH INJURY

i. In any needle stick or splash injury, please liaise with Unit Keselamatan dan Kesihatan Pekerjaan (UKKP) Hospital Teluk intan.
ii. Sister in-charge of the safety unit shall call the Medical officer / Clinical Microbiologist on call on the day to inform the case.
iii. The blood specimen must be sent in pairs (except for cases with unknown sources) and specify on the request form the status of the specimen either victim/staff or patient/source.
iv. Once sample received by serology laboratory, test will be performed accordingly and preliminary result will be informed to the safety unit by Medical officer / Clinical Microbiologist on call on the day.
v. Result shall be released in the LIS within 24 hours.

13.11 ORGAN / TISSUE DONATION

i. For organ transplant, the Medical officer / Sister in charge shall call the Medical officer / Clinical Microbiologist on call on the day for arrangements with referral centre.
ii. To send blood specimens for infective screening and COVID-19 screening to the microbiology laboratory. The result shall be released in the LIS within 4 hours.
iii. Further arrangements for referral testing will be conducted by Transplant Team Hospital Teluk Intan.

13.12 Viral Specimens

i. Some samples can be submitted, without utilizing a transport media, with a reasonable
ii. expectation of virus viability. Specimens in this category includes:

iii. Sterile fluids:
    a. Cerebrospinal fluid
    b. Pleural fluid
    c. Blood
    d. Urine
iv. Non-sterile specimens:
    a. Broncho alveolar lavage
    b. Faeces

v. Whenever there is a question of stability, the specimen should be placed in a suitable virus transport media such as VTM.
vi. Refer to specific tests in the alphabetical test list of this Handbook for more information.
vii. Tissue and biopsy material can be placed directly into the viral transport media.
viii. Each sample need not be more than 1-2 cm in diameter.
ix. Abscess material, bullae, pustules, vesicles, lesions, and skin scrapings can be collected on a Dacron swab and placed directly into viral transport media. If the material has been aspirated, place no more than 3 ml (equal to the amount of transport media) in the vial of M4RT.
x. CSF should be submitted in a sterile container.
xi. Urine should be submitted in a sterile container.
xii. Rectal swabs (Dacron only) should be submitted in M4RT.
xiii. Blood should be submitted in an EDTA/ Plain tube.
xiv. Swabs that are made of calcium alginate and wood are known to interfere with the recovery of some viruses. These can also act as PCR inhibitors and are not appropriate for this type of testing.
xv. Mumps: Acceptable specimens for culture include buccal swabs after parotid gland massage and urine.

ANATOMIC PATHOLOGY LABORATORY

ANATOMIC PATHOLOGY LABORATORY

14. HISTOPATHOLOGY UNIT

14.1. Introduction

Histopathology unit Hospital Teluk Intan provided a few services that involved study of biological tissue for diseases under macroscopic and microscopic examination. This includes assessment of tissue biopsy from multiple hospital departments, specimens removed during surgery, as well as investigation of disease at autopsy.

14.2. List of Services

a. General (routine) histopathological examination of tissue under light microscopy.
b. Histochemistry (special stain)
c. Immunohistochemistry (IHC)
d. Clinical autopsy

14.3. Where to find us?

a. Histopathology unit is located within the main pathology laboratory of HTI. Our receiving counter (*Kaunter Mini Unit Histopatologi and Sitologi)* is next to the entrance of the main laboratory counter (Integrated Unit).

b. If you have an enquiry, please call histopathology unit (ext. 8459) or speak to the medical officer (ext.8575) or pathologist (ext. 8940/8449) in charge.

14.4. General (Routine) Histopathological Examination of Tissue

a. Request For (Routine) Histopathological Examination

i. Each set of specimens must be accompanied by a copy of request form (PER. PAT 301)

ii. The request form must be complete with patient details, ward or clinic locations, relevant clinical information and working diagnosis, specimen type and request, date and time of specimen collection, and name of doctors in charge.

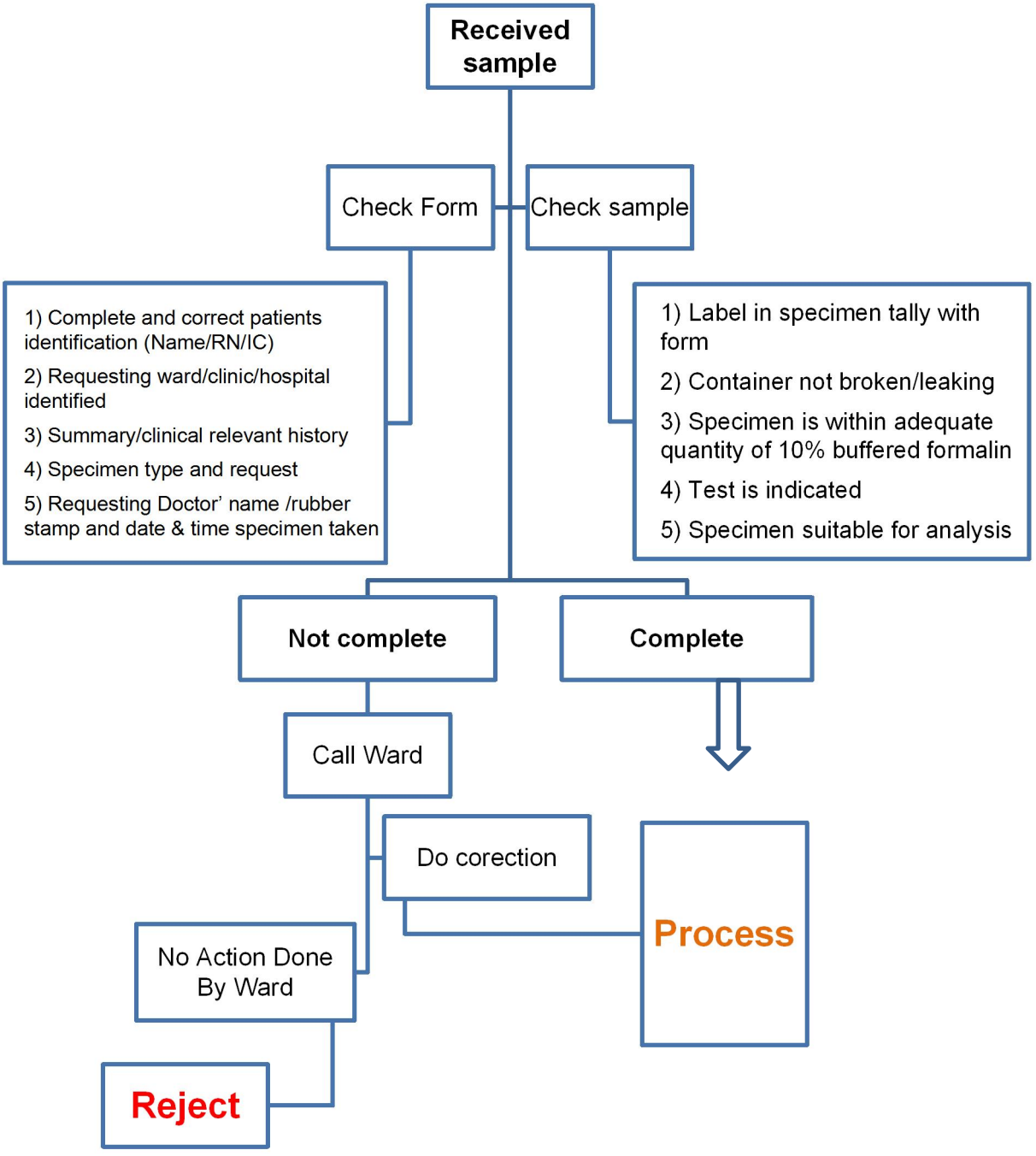
iii. If the report is required as urgent, kindly mark the form with the word 'URGENT' clearly at the top of the right-hand corner.

iv. Specimens will be rejected by histopathology unit based on a few criteria only if there is no intervention done by the primary team.

v. The criteria and procedure for rejection are as follows:

REJECTION CRITERIA
REQUEST FORM
1. No / wrong / empty request form
2. No patient's information / Incomplete patient identification / Incorrect patient identification
3. No clinical history
4. No requestor location stated (ward/clinic/hospital)
5. Test requested not stated
6. Date / time of specimen collection not stated
7. No name and stamp of requestor
SPECIMEN
1. No specimen / Empty container
2. Insufficient specimen volume
3. Unsatisfactory / Unsuitable specimen for analysis
4. Leaked / spilled specimen
5. Wrong container / specimen
6. No / Incomplete label on specimen
7. Duplicate specimen
8. Mislabel / duplicate label / Reuse label
9. Patient's information on request form and specimen not tally

REJECTION PROCEDURE FOR HISTOPATHOLOGY SPECIMENS



b. Specimen Collection and Handling

i. All specimens for routine histological examination are to be fixed in the 10% formalin in suitable clean leak-proof containers, non-fragile and wide opening.

ii. The volume of 10% formalin used must be at least 10 times the volume of the specimen. The specimen must be fully immersed in the formalin. This is to ensure optimum tissue fixation.

iii. Do not put large specimens in the small container as this would prevent proper fixation of the tissue and distort the specimen.

iv. The container must be properly labelled with name, identification number and type of specimen. The label should have the same identification details as written on the request form.

v. Specimens from different anatomical sites should be sent in separate containers.

vi. For cases that require microscopic confirmation of the surgical margin adequacy, the margins of the specimens must be marked or tagged accordingly with suture and/or diagrammatic representation of the excised specimens.

vii. Renal biopsy for immunofluorescence:

a. Fresh tissue for renal biopsies should be placed in a sterile container with Phosphate Buffer Saline solution pH 7.0.

b. Specimens will be sent to the referral laboratory, HRPB Ipoh and will be read and reported by pathologist HRPB Ipoh.

viii. Skin biopsy for Immunofluorescence study:

a. For immunofluorescence study, fresh skin biopsy should be placed in sterile containers with Normal Saline solution. This will be sent to the laboratory HRPB for immunofluorescence staining.

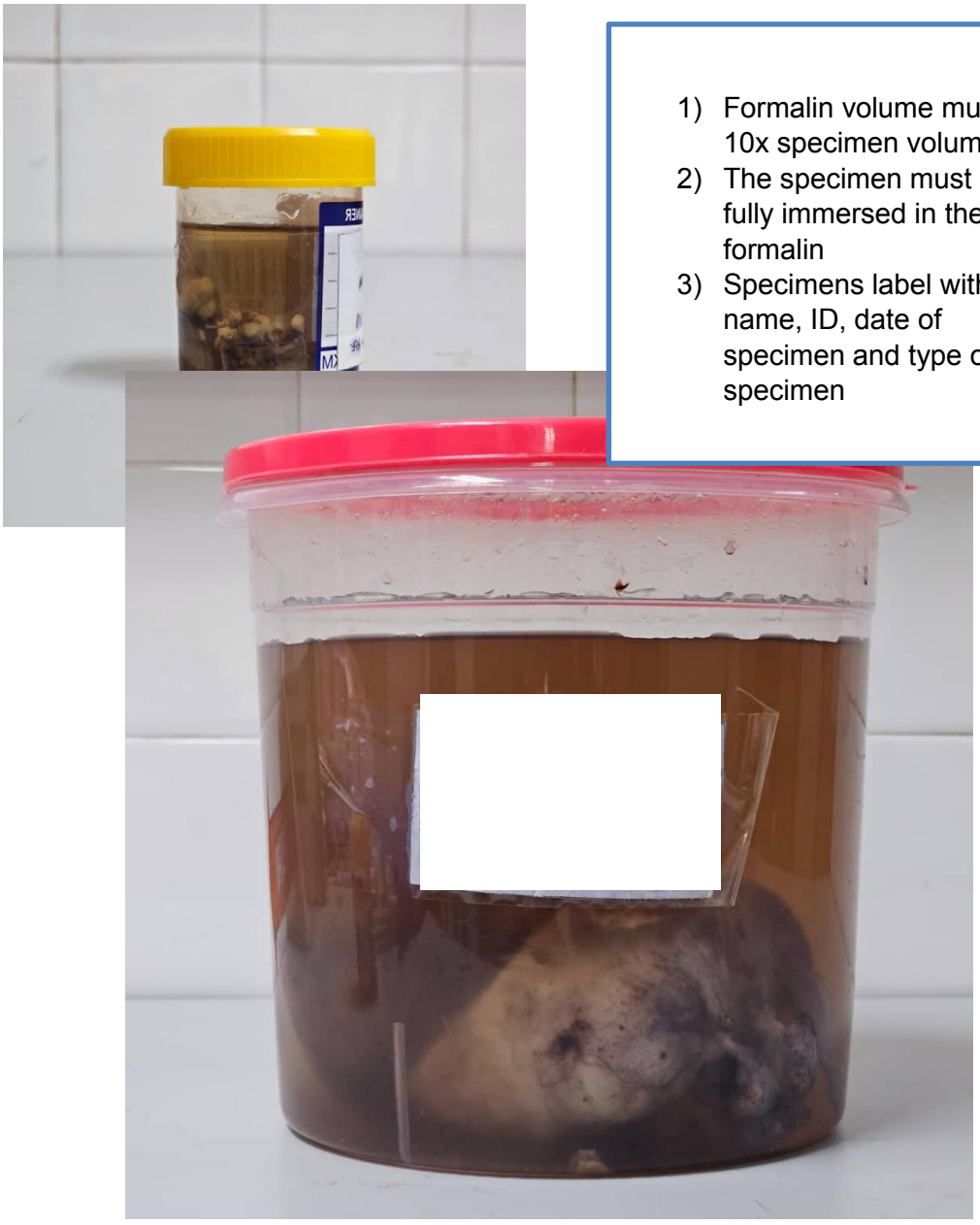
b. This immunofluorescence study will be read and reported by pathologist Hospital Teluk Intan together with the routine H&E skin biopsy.

ix. Muscle biopsy:

a. Muscle biopsy histopathology assessment is not provided in HTI.

b. The clinician should make the proper arrangement with the referral laboratory, HKL.

Examples of Container And Volumes Of Formalin Use In Histopathology Specimens



1) Formalin volume must be 10x specimen volume
2) The specimen must be fully immersed in the formalin
3) Specimens label with name, ID, date of specimen and type of specimen

c. Transportation of Specimen

i. All the specimens and request forms for routine histopathological examination should be **sent directly to Histopathology and Cytopathology receiving counter** during office hours only (not to the main laboratory reception counter) to prevent missing specimens.

ii. Fresh tissue should be properly packed and transported in ice or dry ice if the specimen cannot reach the laboratory immediately.

d. After Office Hours Specimen

i. All specimens for routine histology examination taken after office hours should be fixed in the usual manner (in formalin) in the respective OT or ward and kept at room temperature.

ii. The specimen should then be dispatched to the histopathology unit counter during the next operating hours.

iii. Please do not send the specimen to the main pathology laboratory counter (Integrated) after office hours to prevent missing specimen.

e. Histopathology Reports

i. Reports of urgent biopsies will be available 3 days after the specimen is received unless the biopsy needs further staining, a second opinion etc.

ii. Please write requesting the doctor's name and contact number on the request form for early flagging of results of urgent biopsy.

iii. All histopathology specimens will be reported by the pathologist in charge. The final reports of routine specimens will be released within 2 weeks to 1 month.

iv. The report will be delayed in cases that need further grossing, better sectioning, requiring prolonged decalcification, ancillary testing or external referral for consultation.

v. The reports can be traced by respective clinics or departments through laboratory information systems (LIS).

vi. Report enquiry:

a. Tracing of reports over the phone by clinical staff is discouraged. However, in case of urgent reports, the DOCTOR in charge can call the lab (ext. 8459) or speak to the medical officer (ext.8575) or pathologist (ext. 8940/8449) in charge.

b. The requesting doctor is welcome to discuss the case directly with the reporting pathologist.

14.5 Immunohistochemistry (IHC) And Histochemistry (Special Stain)

a. Histochemistry and immunohistochemistry testing is done only if required and not in one go based on microscopic examination of H&E-stained slides by the pathologist in charge.

b. In cases that require extensive immunohistochemistry and histochemical stain, the stain will be done in HRPB Ipoh and Hospital Kuala Lumpur (outsource). A delay in final reporting will be expected.

c. A preliminary report will be released while waiting for these stains to be back from the respective referral laboratory. We encourage clinicians/ surgeons to directly communicate with pathologists if they have any enquiry regarding pending cases.

14.6 Clinical Autopsy

i. Clinical autopsy or post-mortem examination is conducted to ascertain the cause of death in non-medicolegal cases who passed away in the Hospital Teluk Intan.

ii. The following procedure should be followed:

a. The requesting doctor shall first obtain written consent from the next of kin. Use Borang Keizinan Bedah Siasat Mayat Klinikal (Autopsy Clinical HTI).

b. This consent form is available at the mortuary counter of the Forensic Department, Hospital Teluk Intan.

c. In cases where the next of kin is not available, the Hospital Director and one medical specialist will have to give their consent.

d. If the deceased is a foreigner, where the next of kin is not available, consent from their respective embassy official is required.

e. The clinician requesting the clinical autopsy should communicate directly with Histopathologist on call.

f. The autopsy is usually performed during office hours.

g. A clinical summary together with the case notes and consent form shall be sent to the medical officer or pathologist on duty.

h. The requesting specialist from the clinical department is **required to be present** during the autopsy

iii. Final reporting will be available within 3 months.

14.7 Molecular Testing for Cancer Genetics

a. Molecular histopathology testing will be outsourced to a molecular testing centre (Hospital Tuanku Azizah). Refer section **Referred Test** for a list of genetic cancer tests offered in the respective centre.

b. All molecular testing should be requested by the clinician or primary team. Molecular Tests Request Form should be filled.

c. Histopathology lab will provide unstained slides or blocks to the molecular testing centre containing at least 70% of tumour cells and arrange for transport to the centre.

d. The clinician or Primary team must trace the results with the respective molecular testing centre.

14.8 Taking Out Paraffin Blocks/Slides from Histopathology Unit

a. Patient's paraffin blocks and slides are archived in Histopathology Unit.

b. Histopathology unit allows the clinician to take diagnostic material (paraffin block/slide) from the unit for certain valid reasons.

c. The following procedures must be followed.
   i. The request to borrow the diagnostic materials must be made by specialist
   ii. The requesting specialist needs to write a formal letter or memo

14.9 Request to Obtain Microscopic Image from Histopathology Unit

a. Microscopic images are not archived as routine but images can be provided upon request.

b. A request shall be made or endorsed by a specialist and the requesting doctor should communicate directly with the pathologist in charge of the case.

c. For publication:
   i. The abstract of the publication should be provided
   ii. The pathologist who reported the case should be included as a co-author.

14.10 Research

a. Our histopathology unit welcomes research projects or studies to be done in collaboration with our unit.

b. All collaboration studies or research projects must have approval from the head of the pathology department. A copy of the research proposal must be provided.

c. One pathologist from the unit shall be appointed as collaborator or co-researcher.

d. The researcher will be assisted by the appointed Pathologist to retrieve the materials required if the research project requires archival material from this unit.

e. All archival slides can be borrowed for review in the unit only.

f. If paraffin blocks are required for further testing, sections should be done at the allocated station in this laboratory.

g. No archival material should be taken out from the Histopathology Unit

15. CYTOPATHOLOGY UNIT

15.1. Introduction

a. Cytology is a discipline that involves in the morphologic study of cells. It is generally divided into exfoliative and aspiration cytology.

b. Exfoliative cytology involves microscopic examination of specimens that contain exfoliated cells from the body cavities and surfaces.

c. It is further subdivided into **gynaecological** cytology (pap/cervical smears) and non-gynaecological cytology (body fluid such as peritoneal fluid, pleural fluid, CSF, urine, cyst fluid etc)

d. Aspiration cytology involves the examination of cells that are actively obtained by fine needle aspiration.

15.2. List of Services

Cytopathology Unit Hospital Teluk Intan provides a few services as follows:

a. Exfoliative cytology
   I. Non-gynaecological cytology
      - Body fluid- Pleural fluid, peritoneal fluid, CSF, Urine etc
      - Sputum
      - Brushing (bronchial brushing, bronchial washing)
      - Tzanck smear)

   II. Gynecological cytology-
      - Conventional pap smear

b. Aspiration cytopathology (FNAC)
c. Androgen/ Fertility
   - Seminal fluid analysis is to evaluate male sterility.
   - Intrauterine insemination

15.3 Where to Find Us

a. Cytopathology unit is located within the histopathology and cytopathology lab. Our receiving counter (*Kaunter Mini Unit Histopatologi and Sitologi)* is next to the entrance of the main laboratory counter (Integrated Unit).

b. If you have an enquiry, please call cytopathology unit (ext. 8459) or speak to the medical officer (ext.8575) or pathologist (ext. 8940/8449) in charge.

15.4 Non-Gynaecological Cytology:

a. The specimens must be accompanied by 1 copy of PER. PAT 301 request form.

b. The specimen container or smear must be labelled with the patient's name together with the I/C number and specimen type.

c. The request form should be completed with the patient's identification, ward, type of specimen, date, time of sample taken, and relevant clinical data.

d. Without the doctor's signature, name and stamp chop, the request form will be rejected.

e. If an urgent result is required, please mark URGENT over the right-hand corner of the form.

f. All cytology specimens should be sent to the Histopathology and Cytopathology unit service counter during office hours. Please alert the staff and do not leave the specimens unattended at the counter.

g. Specimens received after office hours should be submitted at the Pathology Department (Integrated) main counter and will be processed during next office hours.

h. Specimen collection:

- Body fluid (pleural fluid, peritoneal fluid, pericardial fluid, vitreous fluid, CSF)
    - Specimens are collected in a clean sterile container and dispatched immediately to the cytology laboratory.
    - Body Fluid (Bronchial, Pericardial, Pleural, Peritoneal) minimum 30 ml or as collected.
    - CSF minimum 1 ml (preferable > 3 ml)
    - Keep specimen in the fridge at 2-8° if delay is anticipated.
- Urine
    - The patient should void and discard the first-morning specimen.
    - DO NOT send overnight urine as most of the cells in this sample are degenerated.
    - Minimum 20ml volume of sample.

- Collect the next voided urine and send immediately to the cytology laboratory.

- Sputum
  - Specimen must be collected in three consecutive days
  - Instruct the patient to empty the mouth of all saliva immediately after waking up in the morning.
  - The patient should cough deeply and collect the sputum in the container supplied.
  - The specimen must be sent immediately to the cytology laboratory.
  - DO NOT forget to collect a similar specimen in the next two days.
  - The specimen container should be labelled according to the day the specimen is collected.
- Vesicle fluid/ Tzanck smear
  - Select a fresh blister on the patient
  - Using a blunt scalpel blade gently deroof the lesion.
  - Scrape the base of the lesion.
  - Smear the tissue onto a clean microscope slide.
  - Air dry the slides.
  - Place the slide in a slide mailer and send it immediately to the cytology laboratory for Giemsa staining.

15.5 Gynaecology Cytology

a. Gynecology cytology is a field of pathology concerned with the investigation of disorders of the female genital tract.

b. Filled in Pap Smear Request Form PS 1/98 (pindaan 2019).

c. Smear preparation (conventional pap smear):
   - Label the glass slide with the patient's name and identification number on the frosted end.
   - Do not use lubricant on the spatula
   - The cervical spatula is placed at the external os and rotated at least 360 degrees, lightly scraping the squamocolumnar junction.

- Smear the material onto a clean labelled glass slide about as thick as blood film.

- Immediately place the slide container containing 95% alcohol, for at least 15 minutes. Another alternative is using spray fixative.

d. Slides are to be sent directly to Cytology Unit through the Histopathology and Cytopathology unit service counter.

15.6 Fine Needle Aspiration Cytology

a. FNAC clinic is conducted on an appointment basis.

- Radiology: Every Tuesday (2.30 pm to 4.30 pm)
- Surgical clinic: Wednesday 2nd & 4th week (2.30 pm to 4.30 pm)
- Otorhinolaryngology clinic: Thursday 2nd & 4th week (3.00 pm to 4.30 pm)

b. Appointment must be made during office hours through phone call. (EXT 8459).

c. Urgent FNAC is available during office hours upon request by Clinician.

d. The request form (PER. PAT 301) should be filled legibly, complete with patient information, relevant clinical history, clinical examinations, provisional diagnosis and requesting clinician name.

e. Clearly state the aspiration site, clinical examination of the lump and aspiration finding in the request form.

f. Please state which lump is aspirated and labelled differently whenever there is more than one lump.

15.7 Seminal Fluid Analysis

a. Seminal Fluid Analysis Is Used To Evaluate Male Fertility.

b. The Test Is Done On An Appointment Basis. Please Come To The Histopathology And Cytology Service Counter (*Kaunter Mini Unit Histopatologi & Sitologi)* To Book An Appointment.

c. The Clinician / Clinic Staff Should Explain And Instruct The Patient To Follow The Seminal Fluid Collection Guideline. This Is To Ensure The Specimen Is Optimal For The Analysis.

d. A Request Form (PER. PAT 301) Should Be Filled Legibly, Complete With Patient Information, Relevant Clinical History, Clinical Examinations, Provisional Diagnosis And Requesting Clinician Name.

e. Please State The Time Of Collection At The Container Provided And Send The Specimen Immediately Or Within 1 Hour After Collection To The Histopathology And Cytopathology Unit Service Counter.

15.8 Cytopathology Reports

a. All FNAC, non-gynaecology, unsatisfactory and abnormal gynaecological pap smears will be reported by Pathologist.

b. Cytology reports can be viewed in the LIS system.

c. Enquiry of reports over the phone is discouraged. However, in case of urgent reports, the doctor in charge can call the lab (ext. 8459) or speak to the medical officer (ext.8575) or pathologist (ext. 8940/ 8449) in charge.

TRANSFUSION MEDICINE (MAKMAL TRANSFUSI)

16. MAKMAL TRANSFUSI

16.1. Ujian yang dijalankan di Makmal Transfusi

i. Ujian Rutin

Definisi : Ujian yang tidak memerlukan temujanji

Ujian rutin yang ditawarkan ialah :

a. ABO Blood Grouping
b. Rhesus Blood Grouping
c. Direct Coomb's test (DCT)
d. Indirect Coomb's test (IAT)
e. Group, Screening and Hold (GSH)
f. Group Screening and Crossmatch (GXM)
g. Rh Phenotyping
h. Transfusion reaction investigations
i. Cold Agglutinin (dengan temujanji)

ii. Ujian Rujukan

Definisi : Ujian yang dihantar ke Makmal Rujukan (Jabatan Transfusi Hospital Raja Permaisuri Bainun (HRPB) / Pusat Darah Negara (PDN) / mana-mana institusi KKM;

Ujian untuk rujukan yang ditawarkan adalah :

a. RBC Phenotyping (HRPB)
b. Antibody Identification (HRPB / PDN)
c. Platelet Immunology Test - Antibody / Antigen Testing (PDN)
d. RBC Genotyping (PDN)
e. Antibody Identification and Crossmatching (Rare Blood Group) (HRPB/PDN)
f. Antibody Titre (HRPB)
g. Iso hemagglutinin Titre (HRPB)
h. Inconclusive result for further investigation (HRPB/PDN)

Perincian ujian yang dijalankan adalah seperti di seksyen *List of Tests*.

16.2 Panduan Penolakan Spesimen Ujian

a. Spesimen Ujian akan ditolak mengikut kriteria yang ditetapkan.Rujuk **Jadual A.**
b. Spesimen yang ditolak tidak akan dikembalikan, dan nama jururawat/pegawai perubatan yang dimaklumkan akan dicatatkan pada borang permohonan ujian yang ditolak.
c. Wad/klinik perlu menghantar spesimen dan borang permohonan baru menggantikan spesimen atau permohonan yang ditolak.

Jadual A

	KRITERIA PENOLAKAN SAMPEL
1	Percanggahan Identiti (Nama / No Kad Pengenalan /RN)
	a) Maklumat pesakit pada borang berbeza dengan sistem (rekod sebelumnya) b) Maklumat pesakit ditulis dengan tidak jelas di borang permohonan c) Maklumat pesakit pada label sampel berbeza dengan maklumat pada borang atau sistem
2	Borang tidak lengkap
	a) Tiada diagnosis b) Maklumat pesakit tidak ditulis pada borang c) Tiada nama Pegawai Perubatan yang menandatangani borang permohonan dan yang mengambil sampel.
3	Sampel dan label sampel
	a) Sampel darah *hemolysed* b) Sampel tidak mencukupi c) Sampel bocor d) Sampel beku *(clotted)* e) Tiada sampel f) Tiada tarikh/masa sampel diambil g) Tiada no KP pada label sampel h) Label sampel kabur atau rosak *i)* Label di tiub sampel ditampal tetapi bertindih (*double label)* j) Sampel darah diambil lebih daripada 4 jam
4	Lain-lain
	a) Jenis ujian di borang dan label berbeza b) Jenis tiub tidak sesuai c) Bekas sampel kosong d) GSH belum tamat tempoh (48 jam) e) Pegawai yang memohon GSH/GXM berbeza dengan Pegawai Perubatan yang mengambil dan melabel sampel f) Tiada borang permohonan g) Tiada sampel

16.3 Panduan Penghantaran Keputusan Ujian

a. Borang keputusan ujian makmal boleh diambil dari *pigeon hole* di makmal transfusi

b. Bagi keputusan ujian rujukan, wad perlu menghubungi semula makmal dalam tempoh 2 hingga 4 minggu untuk mendapat salinan keputusan.

16.4 Komponen Darah

1. Komponen Darah Yang Ditawarkan Di Hospital Teluk Intan adalah
   a. Packed Cell
      - *Buffy Coat Poor Packed Cell*
      - *Filtered Packed Cell*

   b. Whole Blood
      - *For exchange transfusion cases*

      Bergantung kepada ketersediaan stok

   c. Platelet

   d. Fresh Frozen Plasma (FFP)

   e. Cryoprecipitate

   f. Plasma Reconstitute (for exchange transfusion cases)

2. Terdapat beberapa jenis produk yang dikategorikan *special blood product (eg; irradiated blood products, washed blood products)* dan pembekalannya bergantung kepada indikasi klinikal yang sesuai. Produk-produk tersebut tiada di Unit Perubatan Transfusi, Hospital Teluk Intan dan memerlukan rujukan.
3. Pembekalan darah, plasma (*FFP dan cryoprecipitate*) dan platelet perlulah *compatible* dengan kumpulan darah pesakit. Rujuk **Jadual B.**
4. Namun, bagi platelet, jika kumpulan darah tersebut tiada, platelet dari kumpulan lain boleh diberikan.

Jadual B

ABO BLOOD GROUPING OF PATIENT	**ABO GROUP OF PACKED CELL TO BE ISSUED**	**ABO GROUP OF PLASMA TO BE ISSUED**	**ABO GROUP OF PLATELETS TO BE ISSUED**
UNKNOWN	ISSUE O IF URGENT	ISSUE AB IF URGENT	If the platelet of the recommended groups is not available, platelets of other groups may be given.
O	O	O, AB, A, B	
A	A, O	A, AB	
B	B,O	B, AB	
AB	AB, O , A, B	AB (depends on availability) To supply A or B if AB not available	

(Reference: *Handbook of Clinical Use of Blood, Pusat Darah Negara, 3rd Edition 2020)*

LIST OF TESTS (Internal)

- **Integrated Laboratory (Chemical Pathology & Hematology)**
- **Microbiology Laboratory**
- **Anatomic Pathology Laboratory**
- **Transfusion Medicine Laboratory**

LIST OF TESTS AVAILABLE IN INTEGRATED LABORATORY

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
1	Acetaminophen (Paracetamol)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending the sample
2	Alanine Transaminase (ALT)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
3	Albumin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	UACR	Universal container	10 ml	Normal working hours	Routine: 1 day	First morning void is preferred
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Body Fluids	Universal container	10 ml	Normal working hours	Routine: 1 day	-
4	Albumin Globulin Ratio (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
5	Alkaline Phosphatase (ALP)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
6	Alpha Fetoprotein (AFP)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature
7	Amikacin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending the sample
8	Ammonia	Chemical Pathology	Blood	EDTA tube	2 ml	24 Hours	Urgent: 90 minutes	Need to inform laboratory to prepare for testing prior to sending. Transport to laboratory immediately in ice slurry
9	Amylase	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
10	Amylase/ Diastase	Chemical Pathology	Urine	Universal container	10 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
11	Aspartate Transaminase (AST)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
12	Beta Human Chorionic Gonadotrophin (BhCG)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	3 days	Relevant indication with specialist signature. For urgent request, please consult Pathologist / Medical Officer
13	Bilirubin, Direct	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
14	Bilirubin, Total	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
15	Bilirubin, Indirect (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
16	Blood Gases (Arterial/ Venous)	Chemical Pathology	Blood	Heparinized syringe with cap	1 ml	24 Hours	1 hour	Transport to laboratory immediately in ice slurry for accurate result (within 30 minutes)
17	B12, Vitamin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
18	Bone Marrow Aspirate	Hematology	Whole Blood	Smear	-	Normal Office Hours and by appointment only	BMA Routine: 7 working days Urgent: 3 days BMT H&E Staining only: 7 working days H&E +IHC: No TAT	All cases must be discussed with Haematopathologist. Require appointment with Haematology Lab staff and the appointment is only during office hours. Preferred on Tuesday to facilitate Immunophenotyping referral to HRPB.
19	CD 4	Hematology	Whole Blood	EDTA tube	Adult:3.5 mL Paediatric: 0.5 mL	Normal Working Hours	36 hours	Stored at ambient temperature of 18-28°C.
20	Calcium	Chemical Pathology	Blood	Plain gel tube	4 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
21	Calcium Creatinine Ratio (Calculated)	Chemical Pathology	Urine	Universal container	10 ml	Normal working hours	Routine: 1 day	-
22	Cannabinoids screening	Chemical Pathology	Urine	Universal container	20 ml	Normal working hours	5 days	MUST follow the procedure to maintain the chain of custody. Please refer to Procedure for Drug of Abuse

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
23	Cannabinoids confirmation	Chemical Pathology	Urine	Universal container	20 ml	Normal working hours	10 days	MUST follow the procedure to maintain the chain of custody. Please refer to Procedure for Drug of Abuse
24	Carbamazepine	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours	Need to inform laboratory to prepare for testing prior to sending the sample
25	Carcinoembryonic Antigen (CEA)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature
26	Cast and crystal	Chemical Pathology	Body Fluids	Universal container	4 ml	Normal working hours	Routine: 1 day	-
27	Chloride	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
28	Chloride	Chemical Pathology	CSF	Bijou bottle	1-2-ml	24 Hours	Urgent: 90 minutes	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
29	Cholesterol, Total	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
30	Coagulation Profile (PT, INR, APTT)	Hematology	Plasma	Sodium Citrate tube	Adult/ Paediatric 1.8 mL	24 hours	Routine: 120 minutes. Urgent: 90 minutes	Must be sent to the laboratory immediately
31	C-Reactive Protein (CRP)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	Relevant indication with specialist signature
32	Creatine Kinase	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
33	Creatinine	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Body Fluids	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	First morning void is preferred
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
34	Creatinine, Random	Chemical Pathology	Dialysate	Plain gel tube	3.5 ml	Normal working hours	Routine: 1 day	-
35	Creatinine Clearance (Calculated)	Chemical Pathology	Blood and 24-hour urine	Plain gel tube 24-hour urine container	Blood: 3.5 ml Urine: As per collected	24 Hours	Routine: 1 day	Both 24-hour urine and blood sample must be sent together

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
36	CSF Biochemistry (Glucose)	Chemical Pathology	CSF	Sodium fluoride, oxalate tube/ Bijou bottle	1-2-ml	24 Hours	Urgent: 1 hour	Must be sent together with plasma glucose different containers
37	CSF Biochemistry (Total protein)	Chemical Pathology	CSF	Bijou bottle	1-2-ml	24 Hours	Urgent: 1 hour	-
38	D-Dimer	Hematology	Plasma	Sodium Citrate tube	Adult/ Paediatric 1.8 mL	24 hours	Routine: 90 minutes. Urgent: 60 minutes	Must be sent to the laboratory immediately
39	Digoxin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending the sample
40	Erythrocyte Sedimentation Rate	Hematology	Whole Blood	Tri-Sodium citrate tube	1 mL	Normal working hours	Routine: 180 minutes. Urgent: 60 minutes.	-
41	Estimated Glomerular Filtration Rate (eGFR) based on CKD EPI	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	Upon request
42	Fat globules	Chemical Pathology	Urine/Stool	Universal container		Normal working hours	1 day	
43	Ferritin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
44	Free T4 Cord Blood	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	3 days	Reflex testing by laboratory if required
45	Folate	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature
46	Full Blood Count (FBC)	Hematology	Whole Blood	EDTA tube	Adult 3.5 mL Paediatric 0.5 mL	24 hours	Routine: 4 hours Urgent: 45 minutes	Please follow 'Order of Draw' during collection to prevent cross contamination especially Potassium.
47	Full Blood Picture (FBP) -FBP + Retic	Hematology	Whole Blood	EDTA tube	3.5 mL	Normal working Hours	Non-Urgent: 7 days Urgent: 24 hours (Verbal report)	To consult MO/ Pathologist for urgent cases.
48	G6PD semiqualitative fluorescent spot test	Hematology	Whole blood	Filter Paper	Single blot spot of blood	24 hours	1 day	Allow the blood stained filter paper to air dry before sending to the laboratory
49	Gentamicin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending
50	Globulin (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
51	Glucose (Fasting, Random, 2-hour post prandial)	Chemical Pathology	Blood	Sodium fluoride, oxalate tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
52	Glucose	Chemical Pathology	Body Fluids	Sodium fluoride	3.5 ml	Normal working hours	Routine: 1 day	-
53	Glucose, Random	Chemical Pathology	Urine	Universal Container	10 ml	Normal working hours	Routine: 1 day	-
54	Glucose. Random	Chemical Pathology	Dialysate	Sodium fluoride	3.5 ml	Normal working hours	Routine: 1 day	-
55	HbA1c	Chemical Pathology	Blood	EDTA	3 ml	Normal working hours	7 days	Sample repeated in less than 3 months will be rejected
56	HDL Cholesterol	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
57	Haemoglobin Analysis	Hematology	Whole Blood	EDTA tube	3 ml 2 x EDTA tubes (for Hospital Tapah & District Health Clinics)	Normal working hours	90 Days	For Hospital Tapah & District Health Clinics, all requests must be accompanied by FBC results and 2 peripheral blood smear (1 stained
58	Iron	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
59	Iron Binding Capacity, Unbound (UIBC)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
60	Lactate	Chemical Pathology	Blood	Sodium Fluoride, Oxalate	2 ml	24 Hours	Urgent: 1 hour	-
61	Lactate dehydrogenase (LDH)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
		Chemical Pathology	Body Fluids	Universal container	4 ml	Normal working hours	Routine: 1 day	-
62	LDL Cholesterol (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	Unable to report when triglyceride level >4.5 mmol/L
63	Lipid profile (Panel)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
64	Liver function test (Panel)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
65	Magnesium	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
66	Mixing test (APTT/PT)	Hematology	Plasma	Sodium Citrate tube	2 x 1.8 mls for Adult/ Paediatric	Normal office hours and by appointment only	1 day	All cases must be discussed with Haematopathologist prior to sampling. Require appointment with Haematology Laboratory staff after acquire permission from Haematopathologist
67	Morphine confirmation	Chemical Pathology	Urine	Universal container	20 ml	Normal working hours	10 days	MUST follow the procedure to maintain the chain of custody. Please refer to Procedure for Drug of Abuse
68	Morphine Screening	Chemical Pathology	Urine	Universal container	20 ml	Normal working hours	5 days	MUST follow the procedure to maintain the chain of custody. Please refer to Procedure for Drug of Abuse
69	Non-HDL Cholesterol (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
70	pH	Chemical Pathology	Body Fluids	Universal container	5-10 ml	Normal working hours	Routine: 1 day	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
71	Phenobarbital	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending the sample
72	Phenytoin (Dilantin)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending the sample
72	Phosphate Inorganic	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
73	Potassium	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Body Fluids	Universal container	4 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
74	Prostate Specific Antigen (PSA)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	7 days	Relevant indication with specialist signature
75	Protein, Total	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Dialysate	Plain gel tube	3.5 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Body Fluids	Universal container	5-10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
		Chemical Pathology	UPCR	Universal container	10 ml	Normal working hours	Routine: 1 day	First morning void is preferred
76	Reducing Sugar (Qualitative)	Chemical Pathology	Stool	Stool container	1 gram	Normal working hours	Routine: 1 day	-
77	Reducing Sugar	Chemical Pathology	Urine	Universal container	10 ml	Normal working hours	Routine: 1 day	-
78	Renal profile (Panel)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
79	Reticulocyte Count	Hematology	Whole Blood	EDTA tube	Adult 3.5 mL Pediatric 0.5 mL	24 hours	Routine: 4 hours	For urgent cases, please consult MO/ Pathologist
80	Serum Ascitic-Albumin Gradient (SAAG) (Calculated)	Chemical Pathology	Serum and Body Fluids	Plain gel tube / Universal container	Blood: 4 ml Ascitic fluid: 4 ml	Normal working hours	Routine: 1 day	Ascitic fluid and serum albumin must be sent together
81	Sodium	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
82	Stool for occult blood (Qualitative)	Chemical Pathology	Stool	Stool container	1 gram	24 Hours	Routine: 1 day	-
83	Stool for fat globules	Chemical Pathology	Stool	Stool container	1 gram	24 Hours	Routine: 1 day	-
84	Theophylline	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 1 hour	Need to inform laboratory to prepare for testing prior to sending
85	Thyroid Stimulating Hormone (TSH)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	3 days	Relevant indication is a MUST

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
86	Thyroxine, Free (Free T4)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	3 days	Relevant indication is a MUST
87	Thyroid Function Test (TFT) (Panel)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	Normal working hours	3 days	Please consult Pathologist / MO for urgent request.
88	UIBC	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
89	Transferrin Saturation (Calculated)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
90	Triglyceride	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
91	Troponin I	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Urgent: 90 minutes	Relevant indication is a MUST. For fast result, kindly avoid sharing sample with other tests.
92	TSH Cord Blood	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	2 days	-
93	Urate (Uric acid)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
94	Urea	Chemical Pathology	Blood	Plain gel tube	4 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
		Chemical Pathology	Body Fluids	Universal container	4 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Dialysate	Plain gel tube	4 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, Random	Universal container	10 ml	Normal working hours	Routine: 1 day	-
		Chemical Pathology	Urine, 24 hours	24-hour urine container	As per collection	Normal working hours	Routine: 1 day	-
95	Urea and electrolytes (BUSE)	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Routine: 3 hours Urgent: 90 minutes	-
96	Urine Biochemistry	Chemical Pathology	Urine	Universal container	10 ml	24 Hours	Routine: 3 hours	Fresh sample is preferred to avoid contamination
97	Urine Fat Globules	Chemical Pathology	Urine	Universal container	10 ml	Normal working hours	1 day	Fresh sample
98	Urine Microscopy	Chemical Pathology	Urine	Universal container	10 ml	24 Hours	Routine: 3 hours	Fresh sample
99	Urine myoglobin (Qualitative)	Chemical Pathology	Urine	Universal container	10 ml	Normal working hours	1 day	Fresh sample

No	Test	Unit	Specimen Type	Container	Volume	Test Schedule	LTAT	Remarks/ Test requirement
100	Urine Paraquat (Qualitative)	Chemical Pathology	Urine	Universal container	10 ml	24 Hours	Urgent: 1 hour	Fresh sample
101	Urine Pregnancy Test	Chemical Pathology	Urine	Universal container	10 ml	24 Hours	Routine: 3 hours	Fresh sample
102	Valproic acid	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 90 minutes	Need to inform laboratory to prepare for testing prior to sending
103	Vancomycin	Chemical Pathology	Blood	Plain gel tube	3.5 ml	24 Hours	Monitoring: 4 hours Toxicity: 90 minutes	Need to inform laboratory to prepare for testing prior to sending

LIST OF TESTS AVAILABLE IN MICROBIOLOGY LABORATORY

No:	Test	Specimen Type	Container	Cap colour	Volume	Service hours	LTAT	Remarks
1	Aspirated Peritoneal fluids for Cell Count	Peritoneal/ CAPD fluids	Sterile container		2 - 5ml	8 am to 5 pm	24 hours	-
2	Aspirated Body Fluid for Gram Stain	Body Fluid	Sterile container		2 - 5ml	24 hours	24 hours	-
3	Aspirated Body Fluid for Culture & Sensitivity	Body Fluid	Sterile container		2 - 5ml	24 hours	3-5 days	-
4	Aspirated Body Fluid for Acid Fast Bacilli Smear	Body Fluid	Sterile container		2 - 5ml	Office hours	24 hours	All positive smears will be informed to the respective ward
5	Aspirated Body Fluid for Acid Fast Bacilli Culture	Body Fluid	Sterile container		2 - 5ml	Office hours	42 days	SEND TO MKA IPOH

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
6	Blood for Acid Fast Bacilli Culture (Mycobacterium)	Blood	Myco F Lytic BACTEC Bottle		1-5ml	24 hours	42 days	All positive bloods for AFB (using smear method) will be sent to MKAI for confirmation
7	Blood for Culture & Sensitivity (Adult) (For isolation of aerobic bacteria in adult)	Blood	Aerobe BACTEC Bottle		8-10ml	24 hours	**Negative:** 5 days of incubation. **Positive:** 72 hours from positive culture	Only take blood for culture when there is a clinical indication and not as routine investigation. Gram stain for positive blood culture will be communicated by phone immediately. Paediatric bottle/vial should not be used for adult blood sample as smaller blood volume reduce the yield of pathogens.
8	Blood for Culture & Sensitivity (Paeds) (For isolation of bacteria in paediatric patients)	Blood	Paeds BACTEC Bottle		1-3ml	24 hours		
9	Blood for Fungal Culture & Sensitivity	Blood	Myco F Lytic BACTEC Bottle		1-5ml	24 hours	30 days of incubation	-

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
10	Blood film for Malaria Parasites	Blood	EDTA tube		3 ml	24 hours		History of travelling is mandatory to be stated in the request form. Please inform microbe lab (Ext: 6733) before sending sample to the lab.
11	Blood film for Microfilaria	Blood	EDTA tube (Collect at midnight)		3 ml	24 hours	24 hours	**Blood collection time from 10 p.m. - 2 a.m.** Please inform microbe lab (Ext: 6733) before sending samples to the lab.
12	Bronchial alveolar lavage (BAL) for culture & sensitivity	Aspirated Bronchial Alveolar Lavage (BAL)	Sterile container		1 ml	24 hours	3-5 days	-
13	Bronchial alveolar lavage (BAL) for Acid Fast Bacilli Smear	Aspirated Bronchial Alveolar Lavage (BAL)	Sterile container		1 ml	24 hours	24 hours	-

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LAT (Day/Hr/Mi)	Remarks
14	Cerebrospinal Fluid (CSF) (FEME) 1. Cryptococcal Antigen Test 2. Gram Stain 3. Cell Count 4. Indian Ink	CSF	Sterile bijou bottle		2-3 ml (2 bottles)	24 hours	2 hours	-
15	Cerebrospinal Fluid (CSF) Culture & Sensitivity	CSF	Sterile bijou bottle		1 ml (1 bottle)	24 hours	3- 5 days	-
16	Cerebrospinal Fluid(CSF) for Acid Fast Bacilli Smear	CSF	Sterile bijou bottle		1 ml (1 bottle)	24 hours	24 hours	-
17	Corneal Scrapping for culture & sensitivity	Corneal scrapping	Culture plate	Agar plate	Not Applicable	24 hours	5- 7 days	-
18	Corneal Scrapping for fungal culture	Corneal scrapping	Culture plate	SDA agar plate	Not Applicable	24 hours	14-28 days	Fungal confirmatory identification and susceptibility testing will be referred to HRPB

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
19	Ear for culture & sensitivity	Ear swab	Amies Transport Media		Not Applicable	24 hours	3- 5 days	-
20	Endotracheal Aspirate(ETT) for culture & sensitivity	Aspirated fluid	Sterile Container		Not Applicable	24 hours	3 - 5 days	-
21	Environmental swab for culture	Environmental swab	Amies Transport Media		Not Applicable	24 hours	3 - 5 days	-

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
22	Eye for culture & sensitivity	Eye swab	Amies Transport Media		Not Applicable	24 hours	3 - 5 days	-
23	Fungal for culture & sensitivity	Tissue/ hair/ nail/ skin	Sterile Container		Not Applicable	24 hours	21 days	Sample with fungal growth will be referred to a major hospital.
24	Genital swab for culture & sensitivity	Swab	Charcoal Transport Media		Not Applicable	24 hours	3 - 5 days	-
25	High vaginal Swab for culture & sensitivity	Swab	Charcoal Transport Media		Not Applicable	24 hours	3 - 5 days	-

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
26	Low vaginal swab for culture & sensitivity	Swab	Charcoal Transport Media		Not Applicable	24 hours	3-5 days	-
27	Nasopharyngeal for culture & sensitivity	Swab	Amies Transport Media		Not applicable	24 hours	3-5 days	-
		Aspirated fluid	Sterile Container		1 ml	24 hours	3-5 days	-
28	Pus for culture and sensitivity	Pus Swab	Amies Transport Media		Not applicable	24 hours	3-5 days	-
		Aspirated Pus	Sterile Container		1 ml			-

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
29	Peritoneal fluids count	Aspirated Fluid	Sterile container		2 ml	Normal Office Hours	24 hours	-
30	Peritoneal fluid for culture & sensitivity	Aspirated Fluid	Sterile container		2 ml	24 hours	3-5 days	-
31	Pleural fluid for culture & sensitivity	Aspirated Fluid	Sterile container		2 ml	24 hours	3-5 days	-
32	Rectal Swab for Carbapenem Resistant Enterobacteriaceae (CRE)	Swab	Amies transport Media		Not Applicable	24 hours	3-5 days	The rectal swab should only be taken for screening purposes.

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
33	Stool for culture & sensitivity	Stool Swab	Cary Blair transport media		Not Applicable	24 hours	3-5 days	-
34	Sputum for culture & sensitivity	Sputum	Sterile container		Not Applicable	24 hours	3-5 days	-
35	Sputum for Acid Fast Bacilli Smear	Sputum	Sterile container		Not Applicable	24 hours	24 hours	-
36	Sterility Test	Medicine Ointment/ Medicine Fluid	Sterile container		Not Applicable	24 hours	7-14 days	-
37	Skin Smear for Leprosy Stain	Skin smear on slide	Not Applicable		Not Applicable	Normal Office Hours	3 working days	Prepare 3 skin smears from 3 different spots on one slide

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
38	Spore Test	Spore strip	Spore strip		Not applicable	Normal Office Hours	48hours	Sample from Central Supply Sterile Unit (CSSU) only.
39	Swab for *gonorrheae* culture	Swab	Amies with Charcoal Transport Media		Not applicable	24 hours	3-5 days	-
40	Synovial Fluid for culture & sensitivity	Aspirated Fluid	Sterile container		2 ml	24 hours	3-5 days	-
41	Throat swab for culture & sensitivity	Throat Swab	Amies / Stuart Transport Media		Not applicable	24 hours	3-5 days	If Bordetella infection is suspected, to call and inform laboratory as Bordetella pertussis culture will need special media and referred to HRPB

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Test Schedule	LTAT (Day/Hr/Min)	Remarks
42	Tissue for culture & sensitivity	Tissue	Sterile container		Not applicable	24 hours	3-5 days	Add sterile saline to keep the tissue moist.
43	Urine for culture & sensitivity	Midstream Urine /Suprapubic Urine	Sterile container		5ml	24 hours	3-5 days	Send to laboratory immediately after collection.

Serology Tests

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Schedule	LTAT (Day/Hr/Min)	Remarks
1	Anti-Streptolysin Latex Agglutination (ASOT)	Serum	Plain tube		3.5ml	Normal Office Hours	2 working days	

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Schedule	LTAT (Day/Hr/Min)	Remarks
2.	Cryptococcal antigen test	Serum/ CSF	Plain tube/ sterile container		Serum: 3.5ml CSF: 1-2ml	Normal Office Hours	24hours	-
3.	Dengue Combo Rapid Test (NS1, IgM & IgG)	Serum	Plain tube		3.5ml	24 hours	1 hour	-
4.	Human Immunodeficiency Virus (HIV) Combo (Ag & Antibody)	Serum	Plain tube		3.5ml	2 working days per week	5 working days	Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours
5.	Hepatitis C Virus Antibody Test	Serum	Plain tube		3.5ml	2 working days per week	5 working days	Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours
6.	Hepatitis B surface antibody Test	Serum	Plain tube		3.5ml	2 working days per week	5 working days	Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours
7.	Hepatitis B Surface Antigen Test	Serum	Plain tube		3.5ml	2 working days per week	5 working days	Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours
8.	Leptospira Ig M rapid test	Serum	Plain tube		3.5ml	Normal Office Hours	5 working days	Lepto MAT will be sent to MKA Ipoh if Lepto rapid test intermediate or positive

No:	Test	Specimen Type	Container	Cap Color/ Container	Volume	Schedule	LTAT (Day/Hr/Min)	Remarks
9.	Mycoplasma Pneumoniae Particle Agglutination Test	Serum	Plain tube		3.5ml	2 working days per week	5 working days	
10.	Rapid Plasma Reagin (RPR)	Serum	Plain tube		3.5ml	Normal Office Hours	3 working days	Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours
11.	Rheumatoid factor	Serum	Plain tube		3.5ml	2 working days per week	5 working days	
12.	Rotavirus Rapid Screening Test	Stool	Sterile container		50 mg	24 hours	24 hours	
13.	Respiratory Viruses Screening 1. Influenza A 2. Influenza B 3. RSV 4. Adenovirus	Nasopharyngeal swab	Falcon tube		Not applicable	24 hours	24 hours	Please collect kit from the bacteriology laboratory
14.	Respiratory Virus PCR (Qiastat)	Nasopharyngeal swab	Universal Transport medium		Not applicable	Normal Office Hours	24 hours	Please call Serology Laboratory and collect sample kit from Serology laboratory
15.	*Treponema Pallidum* Particle Agglutination	Serum	Plain tube		3.5ml	2 working days per week	3 working days	Only for +ve screening RPR testing Needle prick injury TAT: 24 hours Organ donation TAT: 4 hours

LIST OF TESTS AVAILABLE IN CYTOLOGY UNIT, ANATOMIC PATHOLOGY LABORATORY

NO	TEST	UNIT	SPECIMEN TYPE	CONTAINER	VOLUME	TEST SCHEDULE	LTAT	REMARKS
1	Gynaecology	Cytology	Pap smear (Conventional smear)	Wet fixed smear (95% Alcohol for 15-20 minutes) or cytospray immediately	1 slide	Daily	Urgent: 7 calendar days Routine: 14 working days	-
2.	Andrology	Cytology	Seminal fluid analysis (Seminal fluid)	Universal container	As collected	Daily	Within 1 day	-
		Cytology	Intra uterine insemination (Seminal fluid)	Universal container	As collected	Daily	Within 1 day	As requested by O&G Specialist
3.	Fine Needle Aspiration for Cytology (FNAC)	Cytology	Aspirated material from lump -smeared into slides & 1 plain tube for cell block and ancillary test.	2 smeared frosted slides & 1 plain tube + cytolyte.	As collected	<u>Radiology:</u> -Every Tuesday <u>Surgical Clinic:</u> - Wednesday2nd & 4th week <u>ENT Clinic:</u> -Thursday 2nd & 4th wee	Urgent: 3 days Routine: 7 working days	-

NO	TEST	UNIT	SPECIMEN TYPE	CONTAINER	VOLUME	TEST SCHEDULE	LTAT	REMARKS
4.	Non-Gynaecology	Cytology	Body fluids -pleural fluid -peritoneal fluid -Urine -cyst fluid	Universal container (universal leak proof container)	Minimum of 20 ml up to 200 ml or as collected	Daily	Urgent: 3 days Routine: 7 working days	Dispatch immediately. If delay anticipated refrigerate at 2°C-8°C.
		Cytology	Cerebral spinal fluid	Bijou bottle	As collected	Immediately		
		Cytology	Nipple discharge	Smeared fixed slide	2 slides	Daily		
		Cytology	Bronchial brushing	Air dried smear & smeared fixed slide (95 % alcohol)	1-3 smears	Daily		
		Cytology	Bronchial alveolar lavage (BAL)	Sterile specimen container	As collected	Daily		
		Cytology	Vesicle / Tzanck smear	Smeared fixed slide (95 % alcohol)	1 slide	Daily		

LIST OF TESTS AVAILABLE IN TRANSFUSION LABORATORY

NO	UJIAN	SAMPEL	TIUB	KUANTITI	BORANG	LABORATORY TURNAROUND TIME (LTAT)/ CATATAN
1	ABO Grouping	Blood	EDTA	2.0-3.0 ml	PER - PAT 301	24 jam
2	Rh Grouping	Blood	EDTA	2.0-3.0 ml	PER - PAT 301	24 jam
3	Direct Combs' Test	Blood	EDTA	2.0-3.0 ml	PER - PAT 301	24 jam
4	Indirect Coombs's Test	Blood	EDTA	2.0-3.0 ml	PER - PAT 301	24 jam
5	Group, Screening and Hold (GSH)	Blood	EDTA	2.0-3.0 ml	PER-SS-BT105 (Pind 1/2016)	24 jam Validity : 48 hours at 8am from the day sample taken
6	Group, Screening and Crossmatch	Blood	EDTA	2.0-3.0 ml	PER-SS-BT105 (Pind 1/2016)	2 jam (tanpa GSH) 1 jam (GSH valid di Blood Bank & Code given by MO Blood Bank)
7	Rh Phenotyping	Blood	EDTA	2.0-3.0 ml	PER - PAT 301	3 hari (Hari bekerja)
8	Transfusion Reaction	Blood and Urine	EDTA Urine Container	6.0-9.0 ml blood	BTS/TR/2/2016	14 hari Pulangkan *empty blood bag*, BHT Card dan BTS/TR/2/2016

REFERRED TEST LISTS (EXTERNAL)

CHEMICAL PATHOLOGY REFERRED TEST (ACCORDING TO ALPHABETICAL ORDER)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
1	17-OH Progesterone	Serum	Plain gel tube	3.5 ml	30 days	PER-PAT 301	Endocrinology Laboratory, Hospital Putrajaya	Send specimen frozen or 2-8^{o}C during transportation
2	5-Hydroxy-Indole-Acetic Acid (5-HIAA)	Urine	24-hours urine container with 10 ml of 25% HCL	24-hours urine collection	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	Please follow the instruction for 24-hours urine collection. Transport frozen in dry ice.
3	25-OH-Vitamin D, Total	Serum	Plain gel tube	3.5 ml	60 days	PER-PAT 301	Endocrinology Laboratory, Hospital Putrajaya	Please protect from direct sunlight
4	Acid alpha glucosidase enzyme, Blood spot (POMPE)	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	Ensure blood has completely dried before putting in the plastic sheet.
5	Acylcarnitines & Amino Acids for IEM Screening with Succinylacetone	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	Urgent: 48- 72 hours Routine: 20 days	HTA – IEM Request Form	Genetic Laboratory, Hospital Tunku Azizah	Ensure blood has completely dried before putting in the plastic sheet. Sample must reach HTA Genetic Laboratory as soon as possible.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
6	Adenosine Deaminase (ADA)	Pleural Fluid	Plain container without additives	3 ml (Min: 1 ml)	30 days	MKAK-BPU-U01	MKAK Sungai Buloh	Storage and transport at 2 - 8 °C (Stability: 48 hours)
7	Aldosterone	Plasma	EDTA tube	3.5 ml	30 days	PER-PAT 301	Endocrinology Laboratory, Hospital Putrajaya	Transport to laboratory immediately after collection (without ice). Separate plasma immediately and keep frozen. Transport frozen in dry ice.
8	Aldosterone Renin Ratio (ARR) (Calculated)	Plasma	2 x EDTA tubes	3.5 ml	30 days	PER-PAT 301	Endocrinology Laboratory, Hospital Putrajaya	Transport to laboratory immediately after collection (without ice). Separate plasma immediately and keep frozen. Transport frozen in dry ice.
9	Alcohol (Ethanol)	Serum	Sodium fluoride, oxalate tube	3.5 ml x 2	4-8 weeks	Kimia 15	Jabatan Kimia, (Cawangan Perak), Ipoh	Seal sample and request form.
10	Alpha-1-Antitrypsin Phenotyping	Serum	Plain gel tube	3.5 ml	30 days	IMR - Request Form For Special Protein	Special Protein Unit, IMR, KL	Separated serum must be refrigerated at 2-8°C immediately after collection.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
11	Alpha-1-Antitrypsin Quantitation	Serum	Plain gel tube	3.5 ml	10 days	PER-PAT 301	Chemical Pathology Laboratory, HKL	Separated serum must be refrigerated at 2-8^{o}C immediately after collection
12	Amino acid	Plasma	Lithium Heparin Tube	2 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Collect sample morning fasting or 4 hours after last meal. Separate plasma and freeze immediately. Transport in dry ice.
13	Amino acid	CSF	Sterile Bijou Bottle	1-2 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	MUST send together with plasma specimen. Freeze immediately and transport in dry ice.
14	Amino acid	Urine	Universal container	5 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Active by consultation only. Early morning urine. Freeze sample immediately.
15	Anti-Glutamic Acid Decarboxylase (GAD 65) for neurological disorder	Serum	Plain gel tube	3.5 ml	30 days	IMR- Endocrine Request Form	Endocrine Unit, IMR, KL	Please fill up the entire form with clinician/ specialist's signature. Separate plasma/ serum from RBC immediately. Please send only separated serum/ plasma. All samples must be kept and transported in 2-8^{o}C to IMR.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
16	Anti-Mullerian Hormone (AMH)	Serum	Plain gel tube	3.5 ml	30 days	IMR-Endocrine Request Form	Endocrine Unit, IMR, KL	Please fill up the entire form with clinician/ specialist's signature. Separate plasma/ serum from RBC immediately Please send only separated serum/ plasma All samples must be kept and transported in 2-8^{o}C to IMR
17	Argininosuccinic Acid (ASA)	Random urine	Universal container	2 ml	20 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	All samples must be kept and transported in in dry ice to IMR
18	Biotinidase Enzyme Activity	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	15 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Properly dried at room temperature for 4 hours before putting in plastic bag. Transport at room temperature.
19	Beta-2 Microglobulin	Serum	Plain gel tube	3ml	15 days	PER-PAT 301	Chemical Pathology Lab, Hospital Ampang	Separated serum must be refrigerated at 2-8^{o}C immediately after collection.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
20	Beta-2-Microglobulin	Urine	Universal container	20 ml	15 days	PER-PAT 301	Chemical Pathology Lab, Hospital Ampang	Sample need to be chilled 2-8^{o}C immediately after collection.
21	Biogenic Amines - Neurotransmitter	CSF	Sterile Bijou bottle	2 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Cover from light and heat. Transport frozen.
22	Biogenic Amines - Neurotransmitter	Urine (Random urine)	Universal container	5 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Cover from light and heat. Transport frozen.
23	Cadmium	Blood/ Urine	Sodium fluoride, oxalate tube	3.5 ml x 2	4-8 weeks	Kimia 15	Jabatan Kimia (Cawangan Perak), Ipoh	Seal sample and request form.
24	C-Peptide	Serum	Plain gel tube	3 ml	14 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
25	Cancer Antigen CA 125	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
26	Cancer Antigen CA 15-3	Serum	Plain gel tube	3 ml	7 days	PER-PAT 301	Chemical Pathology Lab, HKL	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
27	Cancer Antigen CA 19-9	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
28	Caeruloplasmin	Serum	Plain gel tube	3 ml	14 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
29	Chromium	Blood/ Urine	Sodium fluoride, oxalate tube	3.5 ml x 2	4-8 weeks	Kimia 15	Jabatan Kimia, Ipoh	Seal sample and request form.
30	Carnitine (Total & Free)	Plasma	Lithium Heparin Tube	3 ml	10 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Freeze immediately. Transport frozen in dry ice.
31	Carnitine	24-hours Urine	24-hours urine container (without preservatives)	24hr urine collection	15 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Active by consultation only. Freeze sample immediately.
32	Cholinesterase	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
33	Complements C3	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
34	Complements C4	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
35	Copper	Serum	Plain gel tube	1 ml	30 days	PER-PAT 301	Chemical Pathology Lab, Hosp Selayang (Transition phase from IMR to Selayang)	Currently suspended. Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
36	Copper	24-hours Urine	24-hours urine container. (Free from heavy metal or trace elements)	24hr urine collection	30 days	PER-PAT 301	Chemical Pathology Lab, Hosp Selayang (Transition phase from IMR to Selayang)	Currently suspended. Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
37	Cortisol (Morning/ Random)	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	Please note on the request form morning or random sample.
38	Cortisol, Urine	24-hours urine	24hr urine container (without preservative)	24hr urine collection (>500ml)	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	Please write the volume of the 24-hours urine sample on the request form.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
39	Creatine & Guanidinoacetic acid	Blood Spot	Whatman 903 filter paper	3 circles of 1 mm diameter or dried blood spot	30 days	IMR-IEM Request Form	Biochemistry Unit, IMR, KL	Ensure blood has completely dried before putting in the plastic sheet.
40	Creatine & Guanidinoacetic acid	Plasma	Lithium Heparin Tube	2 ml	30 days	IMR-IEM Request Form	Biochemistry Unit, IMR, KL	Separate plasma immediately and transport frozen in dry ice.
41	Creatine & Guanidinoacetic acid	Urine	Universal container	5 ml	30 days	IMR-IEM Request Form	Biochemistry Unit, IMR, KL	Freeze immediately and transport frozen in dry ice.
42	Cryoglobulin	Plasma	Sample collection by laboratory personnel in Hospital Ampang	NA	NA	NA	Jabatan Patologi, Hospital Ampang	Contact 03-4289 6216 to refer patient for blood-taking procedure at FNAC Clinic Hospital Ampang.
43	Cyclosporin	Whole blood	EDTA Tube	3.5 ml	3 days	TDM Request Form	Chemical Pathology Lab, HRPB, Ipoh	-
44	Cysteine & Homocysteine	Urine	Universal container	2 – 5 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Protect from light

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
45	Dehydroepiendrosterone Sulphate (DHEA-S)	Serum	Plain gel tube	3 ml	14 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
46	Delta-aminolaevulinic Acid (ALA), urine	Random urine	Universal container	2 ml	30 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Protect from light D-ALA easily destroyed by light. Transport frozen in dry ice.
47	Diabetes Antibodies Panel: - Anti-Islet Cells (ICA) - Anti-Glutamic Acid Decarboxylase (GAD 65) - Anti-Insulinoma-Associated Antigen 2 (IA2)	Serum	Plain gel tube	3.5 ml	30 days	IMR- Endocrine Request Form	Endocrine Unit, IMR, KL	Please fill up the entire form with clinician/ specialist's signature. Separate plasma/ serum from RBC immediately Please send only separated serum/ plasma All samples must be kept and transported in 2-8^{o}C to IMR
48	Electrophoresis, Oligoclonal band	CSF + Serum	Sterile Bijou bottle Plain gel tube	1-2 ml CSF + 1-2 ml Serum	35 days	PER-PAT 301	Chemical Pathology Lab, Hospital Ampang	MUST send both CSF and serum sample simultaneously.
49	Estradiol	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
50	Everolimus	Whole Blood	EDTA Tube	3.5 ml	7 days	TDM Request Form	Chemical Pathology Lab, HKL	-
51	Follicle Stimulating Hormone (FSH)	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB, Ipoh	-
52	Free Light Chain, Kappa & Lambda	Blood	Plain gel tube	5 ml	21 days	PER-PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	-
53	Free Light Chain, Kappa & Lambda	Urine	Universal container	20 ml	21 days	PER PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	-
54	Free Tri- iodothyronine (Free T3)	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	Test is currently suspended in HRPB. If test is needed, please consult with Endocrinologist in HRPB for approval to send to HKL.
55	Free Prostate Specific Antigen (PSA)	Serum	Plain gel tube	3.5 ml	15 days	PER-PAT 301	Core Lab, HKL	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
56	Fructosamine	Serum	Plain gel tube	3.5 ml	21 days	PER-PAT 301	Chemical Pathology Lab, Hospital Ampang	-
57	Galactosemia screening, blood spot	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	21 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Properly dried at room temperature for 4 hours before putting in plastic bag. Transport at room temperature.
58	Gamma Glutamyl Transferase (GGT)	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
59	Growth Hormone (GH)	Serum	Plain gel tube	3.5 ml	30 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
60	Haptoglobin	Serum	Plain gel tube	3.5 ml	14 days	PER-PAT 301	Core Lab, HKL	-
61	Homocysteine, Total	Plasma	Lithium Heparin Tube	2 ml	35 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Separate plasma and frozen immediately. Transport in dry ice.
62	Inborn Error Metabolism (IEM) Screening	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	7 days	IMR- IEM Request Form	Biochemistry Unit, IMR, KL	Properly dried at room temperature for 4 hours before putting in plastic bag. Transport at room temperature.
No	**Test**	**Specimen**	**Container**	**Volume**	**LTAT**	**Form**	**Location**	**Remarks/ Test**

		Type						Requirements
63	Immunoglobulin Ig G, Ig A & Ig M	Serum	Plain gel tube	3-5 ml	30 days	PER-PAT 301	Chemical Pathology, Hospital Ampang	-
64	Interleukin-6 (IL-6)	Serum	Plain gel tube	3.5 ml	30 days	IMR-Autoimmune Request Form	Autoimmune Unit, IMR, NIH Setia Alam	Active by consultation only. Separate serum immediately and transport in 2-8^{o}C
65	Iodine	Urine	Universal container	10 ml	25 days	MKAK-BPU-001	Biochemistry Lab, MKA Ipoh	Sample storage and transportation: 4-8^{o}C (<7 days) -20 ^{o}C (>7 days)
66	Insulin	Serum	Plain gel tube	3 ml	30 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
67	Insulin Auto antibodies (IAA)	Serum	Plain gel tube	3 ml	30 days	IMR-Endocrine Request Form	Endocrine Unit, IMR	Please fill up the entire form with clinician/ specialist's signature Separate plasma/ serum from RBC immediately Please send only separated serum/ plasma All samples must be kept and transported in 2-8^{o}C to IMR
68	Insulin like growth factor-1 (IGF-1)	Serum	Plain gel tube	3.5 ml	30 days	PER-PAT 301	Endocrine Laboratory, Hospital Putrajaya	-
No	**Test**	**Specimen**	**Container**	**Volume**	**LTAT**	**Form**	**Location**	**Remarks/ Test**

		Type						Requirements
69	Lead	Whole blood	Lithium Heparin tube/ EDTA tube	3.5 ml	14 days	PER-PAT 301	Chemical Pathology Lab, Hosp Selayang (Transition phase from IMR to Selayang)	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
70	Lithium	Serum	Plain gel tube	3.5 ml	7 days	TDM Request Form	HBUK, Ipoh	-
71	Lysine Metabolism Profile	Random urine	Universal container	2 ml	20 days	IMR - IEM Request Form	Biochemistry Unit, IMR	-
72	Lysosomal Storage Disorders Screening (LSD)	Blood Spot	Whatman 903 filter paper	3 circles of 1 cm diameter of dried blood spot	21 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Properly dried at room temperature for 4 hours before putting in plastic bag. Transport at room temperature.
73	Lysosomal Storage Disease Enzyme Assays (Refer to list of diseases in the form)	Whole blood	3 x EDTA tubes	2 ml each tube	40 days	IMR - IEM Request Form	Biochemistry Unit, IMR	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.
74	Plasma amino acid, Maple Syrup Urine Diseases (MSUD)	Plasma	Lithium Heparin Tube	0.5 ml (Pediatrics) 2 ml (Adult)	60 days	PER-PAT 301	Genetic Lab, Hospital Tunku Azizah	Separate plasma immediately after collection and freeze the sample
No	**Test**	**Specimen**	**Container**	**Volume**	**LTAT**	**Form**	**Location**	**Remarks/ Test**

		Type						Requirements
75	Plasma amino acid, Phenylketonuria (PKU)	Plasma	Lithium Heparin Tube	0.5 ml (Pediatrics) 2 ml (Adult)	60 days	PER-PAT 301	Genetic Lab, Hospital Tunku Azizah	Separate plasma immediately after collection and freeze the sample.
76	Mercury	Plasma	Sodium Fluoride, Oxalate tube	3 ml	35 days	Borang Jabatan Kimia-15	Jabatan Kimia Malaysia, (Cawangan Perak)	Seal sample and request form.
77	Mercury	Urine	Universal container	20 ml	7 days	MKAK-BPU-001	Heavy Metal Lab, MKAK, Sg Buloh	Please consult MKAK for appointment. Transport in 2-8^{o}C
78	Metanephrine, Urine (24 hours)	Urine	24hr urine container with 10 ml of 32% HCL, (prepared by laboratory)	Min volume: 1L/24 hours	30 days	PER-PAT 301	Chemical Pathology Lab, HKL	While test in HKL is suspended, urgent sample will be sent to Hospital Putrajaya after consultation with Chemical Pathologist
79	Methanol	Blood	Sodium Fluoride tube	3.5 ml	14 days	MKAK-BPU-U01	Biochemistry Lab, MKAK Sungai Buloh	Storage and transport in 4-8^{o}C.
80	Methanol	Urine	Sodium Fluoride tube	5 ml	14 days	MKAK-BPU-U01	Biochemistry Lab, MKAK Sungai Buloh	Storage and transport in 4-8^{o}C.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
81	Methotrexate	Serum	Plain gel tube	3.5 ml	3 days	TDM Request form	Chemical Pathology Lab, HRPB Ipoh	-
82	Mucopolysaccharides (GAGs/ HRE)	Urine	Universal container	5 ml	21 days	IMR – IEM Request Form	Biochemistry Unit, IMR	First morning urine
83	Mucopolysaccharides Enzyme Assay (Panel Test)	Whole blood	3 EDTA Tubes	2 ml x 3	35 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Do not spin and do not FREEZE, send whole blood within 72 hours after collection. Option maximum up to 2 diseases of enzyme. Required consultation by geneticist.
84	Mycophenolic acid	Blood	EDTA Tube	3.5 ml	7 days	TDM Request Form	Chemical Pathology Lab, HKL	-
85	Myoglobin	Serum	Plain gel tube	3.5 ml	21 days	PER PAT 301	Hospital Ampang	-
86	Myoglobin & hemoglobin	Random urine	Universal container	5 ml	14 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Transport in ice
87	Oligosaccharides	Random urine	Universal container	5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR	First morning urine. Transport frozen in dry ice.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
88	Organic acids	Urine	Universal container	5 ml	14 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Collect urine during crisis, freeze immediately and transport frozen in dry ice to prevent bacterial overgrowth and loss of volatile substances
89	Organic acids	Plasma (FORENSIC ONLY)	EDTA tube or Lithium Heparin Tube	1 ml	20 days	IMR - IEM Request Form	Biochemistry Unit, IMR	By consultation only. Separate plasma immediately. Transport FROZEN. Organic acids easily destroyed by heat
90	Organic acids	Vitreous Humor (FORENSIC ONLY)	Universal container/ Plain tube	2 ml	20 days	IMR - IEM Request Form	Biochemistry Unit, IMR	By consultation only. Transport FROZEN. Organic acids easily destroyed by heat
91	Organic acids (Optional: with Succinylacetone)	Urine	Universal container	5 ml	Urgent: 48-72 hours Routine: 20 days	HTA – IEM Request Form	Genetic Lab, Hospital Tunku Azizah	Freeze sample immediately and transport with dry ice.
92	Orotic acids (Orotate)	Urine	Universal container	5 ml	14 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Collect without preservatives. Freeze sample immediately and transport with dry ice.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
93	Osmolality	Serum	Plain gel tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
94	Osmolality	Urine	Universal container	30 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
95	Parathyroid Hormone (Intact) iPTH	Plasma	EDTA Tube	3 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	Transport in ice. Send to HRPB within 48 hours. If longer, to separate the plasma and keep frozen
96	Pipecolic acid	Plasma	Lithium Heparin Tube	2 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Collected 4 hours after meal. Centrifuge and freeze immediately. Transport frozen in dry ice.
97	Porphyria Profile (Quantitative)	Urine	Universal container	5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Protect from light. Porphobilinogen and porphyrin easily destroyed by light. Transport frozen in dry ice.
98	Procalcitonin	Serum	Plain gel tube	3.5 ml	5 days	PER-PAT 301	Institut Kanser Negara	Consultation with IKN's MO needed prior to sampling (03-8892 555 ext4128)
99	Progesterone	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
100	Prolactin	Serum	Plain gel tube	3.5 ml	3 days	PER-PAT 301	Chemical Pathology Lab, HRPB Ipoh	-
101	Protein Electrophoresis	Serum	Plain gel tube	3.5 ml	35 days	PER-PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	-
102	Pterins - Neurotransmitter	CSF	Special microtube with preservative (DTE & EDTA) provided by Biochemistry Unit, IMR	0.5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Cover from light, Transport FROZEN. (Pterins easily destroyed by heat and light).
103	Pterins - Neurotransmitter	Urine	Universal container	1 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR	Cover from light, Transport FROZEN. (Pterins easily destroyed by heat and light).
104	Purine & Pyrimidine	Random urine	Universal container without preservatives	5 ml	Urgent: 48-72 hours Non-urgent: 20 days	HTA – IEM Request Form	Genetic Lab, Hospital Tunku Azizah	Send to the lab immediately or within 4 hours of collection. For external sample, freeze immediately prior transporting to lab Sample must reach HTA Genetic Laboratory in ice-packed container as soon as possible.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
105	Renin	Plasma	EDTA Tube	4 ml	60 days	PER-PAT 301	Endocrine Lab, Hospital Putrajaya	Transport to laboratory immediately after collection (without ice). Separate plasma as soon as possible, transfer into secondary tube and keep frozen. Transport frozen with dry ice.
106	Sex-hormone Binding Globulin (SHBG)	Serum	Plain gel tube	5 ml	30 days	PER-PAT 301	Endocrine Lab, Hospital Putrajaya	-
107	Sialic acid, total and free	Urine	Universal container	5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	First void urine in the morning. Freeze immediately. Transport frozen
108	Sirolimus	Whole Blood	EDTA tube	3 ml	2 days (Sample analysis Tuesday and Thursday)	TDM Request form	Chemical Pathology, Hospital Tunku Azizah	Mix sample properly to prevent clot formation. Sample stability @ 2-8^{o}C < 7 days, if delay, store frozen at <-20^{o}C
109	Sugar & Polyols	Random urine	Universal container	5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	-
110	S-Sulphocysteine	Random urine	Universal container without preservatives.	3-5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	Collect without preservatives. Transport frozen in dry ice.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
111	Succinylacetone	Random urine	Universal container without preservatives	5 ml	30 days	IMR - IEM Request Form	Biochemistry Unit, IMR, KL	Collect without preservatives. Transport frozen in dry ice.
112	Sulphite & Sulphocysteine	Freshly void urine	Universal container without preservatives	2-5 ml	20 days	HTA – IEM Request Form	Genetic Lab, Hospital Tunku Azizah	Send to the lab immediately or within 4 hours of collection For external sample, freeze immediately prior transporting to laboratory. Sample must reach HTA Genetic Laboratory in ice-packed container as soon as possible.
113	Sweat test	Sweat	Sweat collector (collected and analyzed by laboratory personnel)	15 uL	1 day	PER-PAT 301	Core Lab/ Chemical Pathology, HTA	Test performed for in-patient only and required Pediatrics Respiratory Specialist Consultation
114	Tacrolimus	Blood	EDTA tube	3.5 ml	7 days	TDM Request Form	Chemical Pathology Lab, HRPB, Ipoh	-
115	Testosterone	Serum	Plain gel tube	3.5 ml	5 days	PER-PAT 301	Chemical Pathology Lab, HRPB, Ipoh	-

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
116	Thyroglobulin (TG)	Serum	Plain gel tube	3.5 ml	20 days	PER-PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	MUST provide relevant indications and latest thyroid function test result. TG and ATG are used for monitoring of thyroid cancer
117	Thyroglobulin Antibody (ATG)	Serum	Plain gel tube	3.5 ml	20 days	PER-PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	MUST provide relevant indications and latest thyroid function test result. TG and ATG are used for monitoring of thyroid cancer
118	Thyroid Peroxidase Antibody (TPO Ab)	Serum	Plain gel tube	3.5 ml	20 days	PER-PAT 301	Chemical Pathology Lab, Hospital Pulau Pinang	MUST provide relevant indications and latest thyroid function test result.
119	Toxicology Tests - Alcohol - Pesticides - Drugs - Corrosives - Carbon monoxide - Metals - Solvent	Blood	Sodium fluoride tube	10 ml	60 days	Borang Kimia 15	Jabatan Kimia Malaysia (Cawangan Perak)	Seal sample and request form.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
120	Toxicology Tests - Alcohol - Pesticides - Drugs - Corrosives - Carbon monoxide - Metals - Solvent	Urine	Sodium fluoride tube	30 ml	60 days	Borang Kimia 15	Jabatan Kimia Malaysia (Cawangan Perak)	Seal sample and request form.
121	Transferrin	Serum	Plain gel tube	3.5 ml	30 days	PER-PAT 301	Chemical Pathology Lab, HKL	-
122	Transferin Isoform, CDG Type I & II	Serum	Plain gel tube	3.5 ml	30 days	IMR - Request Form For Specific Proteins	Special Protein Unit, IMR	Serum must be refrigerated (2 to 8°C) immediately after collection.
123	TSH Receptor Antibody (TRAb)	Serum	Plain gel tube	3.5 ml	30 days	PER-PAT 301	Chemical Pathology Lab, HKL	MUST provide relevant indications and latest thyroid function test result.
124	Toxicology and Drugs of Abuse - Amphetamine Type Stimulants - Benzodiazepines - Ketamines - Opioids - Cathinones - Synthetc Cathinones (Mytragynine/ Ketom)	Urine	Universal container	30 ml	Medicolegal Cases (60 days) Clinical Cases (14 days)	UPD-1 form for medicolegal and medical check-up PER-PAT 301 for clinical cases	Drug and Toxicology Lab for medicolegal dan medical check-up cases. Kaunter Utama Patologi HKL for clinical cases.	Please follow the Guidelines for Drugs of Abuse Testing (Refer text)

HAEMATOLOGY REFERRED TEST
ACCORDING TO ALPHABETICAL ORDER

(Disclaimer: All LTAT stated in the table below are the LTAT of the Referral Laboratory, hence please be noted that the Total Turn Around Time for Pathology Hospital Teluk Intan from time of specimen received till dispatched of results will be longer).

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
1	ADAMTS-13 activity	Plasma	Trisodium Citrate 3.2%	2 tubes To fill until indicated mark	4-6 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Specialist who requests the test need to make appointment with consultant in Haemostasis unit Hospital Ampang. Please inform SO in Haemostasis unit 03 42896461. Separate plasma from cells as soon as possible (double spin). Platelet count must be $<10x10^{9}/L$ in plasma prior to freezing. Store frozen at -40℃ and transport frozen plasma on dried ice.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
2	ADAMTS-13 inhibitor	Plasma	Trisodium Citrate 3.2%	2 tubes To fill until indicated mark	4-6 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Specialist who requests the test need to make appointment with consultant in Haemostasis unit Hospital Ampang. Please inform SO in Haemostasis unit 03 42896461. Separate plasma from cells as soon as possible (double spin). Platelet count must be $<10x10^{9}/L$ in plasma prior to freezing. Store frozen at -40℃ and transport frozen plasma on dried ice. SO in Haemostasis unit 03 42896461.
3	Anti-Xa assay	Plasma	Trisodium Citrate 3.2%	1 tube To fill until indicated mark	1 day	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	By appointment- Please contact Coagulation lab staff in Hospital Ampang prior to sample collection) Separate plasma from cells as soon as possible (double spin). Platelet count must be $<10x10^{9}/L$ in plasma prior to freezing. Store frozen at -40℃ and transport frozen plasma on dried ice.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
4	Bone Marrow Cytogenetic analysis for hematological malignancy	Bone Marrow Aspirate	Sodium Heparin	4ml	18 days	Borang Bone Marrow Cytogenetic HPP/PAT/HM/SD/151	Hospital Pulau Pinang (Cytogenetic Lab)	Transport sample without delay at room temperature. Do not **FREEZE** specimen. Triple packaging needed. Sample shall reached on Mon-Thursday; postage sample to reach latest by Wednesday.
5	Bone Marrow Molecular Analysis for Acute Leukaemia - Leukemia Translocation Study	Peripheral blood / Bone Marrow Aspirate	EDTA tube	2.5-5.0ml	10 days	Molecular Analysis For Leukemia.	IMR NIH Setia Alam (Molecular Analysis for Leukemia)	The sample must be accompanied with unstained bone marrow slide. Specimen must be collected under sterile condition. Packed in ice during transport & transported as soon as possible.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
6	Bone Marrow Molecular Analysis for Acute Leukaemia - Acute Myeloid Leukemia Study (FLT3/ NPM1/ CEBPA/ c -KIT gene)	Peripheral blood / Bone Marrow Aspirate	EDTA tube	2.5-5.0ml	30 days	Molecular Analysis For Leukemia.	IMR NIH Setia Alam (Molecular Analysis for Leukemia)	The sample must be accompanied with unstained bone marrow slide. Specimen must be collected under sterile condition. Packed in ice during transport & transported as soon as possible.
7	CD 4/ CD8 Enumeration	Fresh peripheral blood	EDTA tube	2.0ml	7 days	PER-PAT 301	HRPB (Hematology Lab)	Mix the blood thoroughly, gently and immediately after collection. Test is run on daily basis during office hours. Avoid direct contact with ice. Sample stability is 48 hours. Do not sand sample of Friday or long holiday, exceed 48 hours of storage.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
8	Chromosomal Study / Karyotyping -Edward Syndrome -Patau Syndrome -Ambiguous genitalia	Peripheral Blood / Bone Marrow Aspirate	Peripheral blood: Lithium heparin tube Bone marrow aspirate: Sodium heparin	3-5ml	8 weeks	Borang Permohonan Ujian Sitogenetik/ Cytogenetics request form (HTA/ Path. Gen/ 01-2021)	HWKKL Genetic Lab	By appointment. The requesting doctor to enquire about the special requirements for the said investigation.
9	Chronic Myeloid Leukemia Mutation Study (T315I)	Peripheral blood / Bone Marrow Aspirate	EDTA tube	2.5-5.0ml	30 days	Molecular Analysis For Leukemia.	IMR NIH Setia Alam (Molecular Analysis for Leukemia)	Relevant clinical history to be signed by attending physician. Specimen must be collected under sterile condition. Transported as soon as possible.
10	Coagulation factor assay (FII, FV, FVII, FX, FXI, FXII, FXIII)	Plasma	Trisodium Citrate 3.2%	Adult: 3 tubes Pead <1: 2 tubes To fill until indicated mark	3 weeks	PER-PAT 301	HTA Hematology Unit	Relevant clinical history to be signed by attending physician. Sample to be centrifuged and frozen at - 40 degrees. Transport frozen plasma on dried ice.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
11	Coagulation factor assay 1. Factor VIII & Factor IX level 2. Factor VIII & Factor IX inhibitor level assay	Plasma	Trisodium Citrate 3.2%	4 tubes To fill until indicated mark	7 days	PER-PAT 301	HRPB Hematology Lab	Relevant clinical history to be signed by attending physician. Urgent request have to consult Hematopathologist.
12	DNA analysis for alpha and beta thalassemia, HbS, HbE and Hb C	Peripheral blood	EDTA	Adult - 2.5ml Pead- 0.5ml	90 days	Borang DNA Analysis for Thalassaemia Syndromes & Haemoglobinopathies 3.0	HKL (Molecular Hematology Laboratory)	Signed by Specialist & include 1. latest FBC result < 3 months) 2. Copy of Hb analysis result . Must include the details of index cases, copy of index cases DNA analysis (if DNA analysis have been done), DNA analysis consent form.
13	DNA analysis (Further Testing for Alpha and Beta thalassemia/ Complicated Alpha thalassemia/ Variants)	Peripheral blood	EDTA	Adult - 2.5ml Pead- 0.5ml	120 days	Borang DNA Analysis for Thalassaemia Syndromes & Haemoglobinopathies 3.0	IMR NIH Setia Alam (Molecular Genetics Lab, Hematology Unit)	Signed by Specialist & include 3. latest FBC result < 3 months) 4. Copy of Hb analysis result . Must include the details of index cases, copy of index cases DNA analysis (if DNA analysis have been done), DNA analysis consent form.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
14	FISH for I) BCR-ABL II) PML-RARA	Peripheral blood / Bone Marrow Aspirate	Sterile sodium heparin tube	2.0-3.0ml	7 days	Bone marrow cyto-genetic	IMR (Bone Marrow Cytogenetics, Genetic Laboratory)	Specialist sign & stamp. Specimen must be collected under sterile conditions. Packed on ice during transport. The specimen should reach the lab immediately upon collection on any day in the morning except on the eve of any public holiday as sample stability is only up to 24 hours.
15	Fibrinogen	Plasma	Trisodium Citrate 3.2%	1 tube To fill until indicated mark	Urgent : 1 hour Routine : 4 hour	PER-PAT 301	HRPB Hematology Lab	Sample to be centrifuged and frozen at - 40 degrees. Transport frozen plasma on dried ice.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
16	G6PD activity assay	Blood	EDTA tube	Pead: 500ul Adult: 2ml	7 days	PER-PAT 301	Hospital Melaka	Fresh sample (kept at 2-8°C) & avoid direct contact with ice. Inform Lab staff before sending specimen. Should arrive on Monday and Wednesday as test only done every Tuesday&Thursday. Sample stability: 48 hours Patient's criteria: 1) Reticulocyte counts <5% for neonate and <2.5% for adult and paeds. 2) 30 days after blood transfusion/ acute hemolysis.
17	Immunophenotyping for Leukemia /Lymphoma (Except PNH, MRD, T-All, T-cell lymphoma)	Peripheral blood / Bone Marrow Aspirate	EDTA tube	3 tubes To fill until indicated mark	10 days	PER-PAT 301	HRPB Hematology Lab	Specialist signed with relevant clinical history. Send immediately in room temperature (20-24℃). Specimen should arrive before 11.30am on Tuesday and Wednesday except for urgent cases eg. hyperleukocytosis syndrome and APML
18	Immunophenotyping for PNH	Fresh peripheral blood	EDTA tube	2 tubes To fill until indicated mark	10 days	PER-PAT 301	HTA Hematology Lab	Specialist signed with relevant clinical history. Send immediately in room temperature (20-24℃).

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
19	Lupus Anticoagulant	Plasma	Trisodium Citrate 3.2%	Min 3 tubes for adult Min 2 tubes for peads	30 days	PER-PAT 301	HRPB Hematology Lab	Request Form with relevant clinical history to be signed by attending physician. Sample to be centrifuged and frozen at -40 degrees & maintained frozen throughout transportation.
20	Molecular tests for Haemophilia A	Peripheral Blood	EDTA	2.5ml	60 days	Haemophilia Genetic Testing Request Form (Version 5.0)	IMR NIH Setia Alam (Hematology Unit, Cancer Research Centre Laboratory)	1. All carrier screening must be accompanied by an index sample with separate request form. 2. A copy of the index and relative genetic test result (if available) 3. Family tree
21	Molecular Analysis for Hemophilia (Hemophilia B), full sequencing or familial mutation	Peripheral Blood	EDTA	2.5ml	30 days	Haemophilia Genetic Testing Request Form (Version 5.0)	IMR NIH Setia Alam (Hematology Unit, Cancer Research Centre Laboratory)	1. All carrier screening must be accompanied by an index sample with separate request form. 2.A copy of the index and relative genetic test result (if available) 3. Family tree

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
22	PCR for BCR - ABL1 for diagnosis (NEW CASE) and FOLLOW UP (monitoring)	Peripheral blood / Bone Marrow Aspirate	EDTA	Peripheral blood: 5 ml (for NEW CASES - qualitative) Peripheral blood: 15ml (for FOLLOW UP CASES - quantitative) Bone marrow aspirate: 2ml	4 weeks: qualitative; 6 weeks: quantitative)	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Form to be signed by specialist. Samples to be transported without delay preferably within 24 hours at room temperature.
23	PCR JAK 2 gene mutation (qualitative)	Peripheral blood / Bone Marrow Aspirate	EDTA	Peripheral blood: 5ml Bone marrow aspirate: 2ml	8 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Form to be signed by specialist. Samples to be transported without delay preferably within 24 hours at room temperature.

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
24	PCR PML-RARA	Peripheral blood / Bone Marrow Aspirate	EDTA	Peripheral blood: 5ml Bone marrow aspirate: 2ml	6 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Form to be signed by specialist. Samples to be transported without delay preferably within 24 hours at room temperature.
25	Platelet aggregation test	Peripheral blood	Trisodium Citrate 3.2%	20ml	3 days	By Appointment Walk in	Pusat Darah Negara (Hemostasis Laboratory)	By appointment. Requesting Dr shall inform pathologist in charge and then to get appointment. Patient have to walk in to PDN for blood sampling
26	Platelet Factor 4 Antibody (PF4-Ab)	Plasma	Plain tube	2 tubes	6-8 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Spin and frozen plasma. Sample should be maintained frozen throughout transportation.
27	Platelet Receptor Flow Cytometry	Hanya melalui temujanji & pesakit perlu datang ke HTA untuk sample collection. Perlu contact Dr Suzana (03-2600 3000 ext 1145)atau Dr Nurima (03-2600 3000 ext 2169 terlebih dahulu.						

No:	Test	Specimen type	Container	Volume	LTAT	Form	Location	Remarks/ Test requirement
28	Protein C, Protein S and Antithrombin Activity, APCR (Activated protein C Resistance)	Plasma	Trisodium Citrate 3.2%	Adult& Pead > 1 year old: 3 tubes Infant <1 year old: 2 tubes	6 weeks	PER-PAT 301	HTA Hematology Lab	Request Form with relevant clinical history to be signed by attending physician. Sample to be centrifuged and frozen at -40 degrees & maintained frozen throughout transportation.
29	Serum Erythropoietin	Serum	Plain tube	1 tube	MDS: 6-8 weeks MPN& PRV: 12 weeks	Hospital Ampang Special Hematology Lab Requisition (HA:HEMA2017 12/17/16)	Hospital Ampang (Special Hematology Lab)	Requesting MO / Physician need to call MO / Specialist Hosp Ampang for screening purposes. Specialist signed with relevant clinical history and diagnosis. Spin and frozen plasma. Sample should be maintained frozen throughout transportation.
30	Von Willebrand factor Profile (VWF:Antigen, VWF activity, VWF:RCo, VWF:Collagen Binding)	Plasma	Trisodium Citrate 3.2%	Adult : 10 mL (4 tubes) Paediatric < 1 year) : 5 mL 2 tubes)	4 weeks	PER-PAT 301	Hematology lab, HTA	Request Form with relevant clinical history to be signed by attending physician. Sample to be centrifuged and frozen at -40 degrees & maintained frozen throughout transportation.

MICROBIOLOGY REFERRED TEST
(ACCORDING TO ALPHABETICAL ORDER)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
1	AFB Culture & Sensitivity	Fluid/ Sputum/ ETT/ Bronchiol Washing/ Pus/ CAPD/ Urine/ CSF/ Skin/ Tissue	Sterile Container/ BIJOU BOTTL	3.5ml (serum)	60 Days	TBIS 20C	MKA Ipoh Jelapang	
2	Carbapenemase genes detection (CRE)	Bacterial Culture	Blood agar or nutrient slant	Pure Isolate	14 Days	PER-PAT 301	Bacteriology IMR NIH Setia Alam	Send patient history with preliminary antibiotic susceptibility test results
3	Enteropathogenic Escherichia coli (EPEC) Serotypying	Bacterial Culture	NA Slant	Pure Isolate	14 Days	PER-PAT 301	MKA Ipoh Jelapang	
4	Fungal Culture and Sensitivity	Fungal Culture	Agar Plate	Pure Isolate	1 Weeks	PER-PAT 301	HRPB	
5	Salmonella Serotyping	Bacterial Culture	NA Slant	Pure Isolate	21 Days	PER-PAT 301	MKA Ipoh Jelapang	
6	Shigella Serotyping	Bacterial Culture	NA Slant	Pure Isolate	14 Days	PER-PAT 301	MKA Ipoh Jelapang	
7	Vibrio Serotyping	Bacterial Culture	NA Slant	Pure Isolate	5 Days	PER-PAT 301	MKA Ipoh Jelapang	

SEROLOGY REFERRED TEST
(ACCORDING TO ALPHABETICAL ORDER)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
1.	Acanthamoeba spp / Naegleria sp. microscopy	Corneal scraping, Contact lens, Contact lens suspension, CSF	Sterile, Air Tight or Contact Lens Storage	NA	3 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	By Appointment at least 3 days before the sample is taken. Medium in container: sterile distilled water or saline. Call IMR For Appointment
2.	Acanthamoeba DNA PCR	Eye Scrapping, Contact Lenses, Lens Suspension	Sterile, Air Tight or Contact Lens Storage with sterile distilled water or saline.	NA	7 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	By Appointment at least 3 days before the sample is taken. Medium in container: Call IMR For Appointment
3.	Acute Encephalitis Syndrome (PCR)	Serum Throat Swab CSF Urine	Plain tube VTM Sterile Container	3.5ml (serum)	14 Working Days	ViraL Encephalitis Meningitis Investigation Request Form	MKA Ipoh Jelapang	Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
4.	Acute Flaccid Paralysis (AFP) Polio Virus (Virus Isolation)	Stool	Sterile Container	8-10g	4-5 Weeks	PER-PAT 301 and AFP Form	Virology, IMR, NIH	Two stool specimens collected 24 h to 48 h within 14 days of paralysis onset.
5.	Allergic Disease Test: IgE, Specific (Per Allergan) IgE, Total	Serum	Plain tube	3ml	10 Days	Allergy Request Form	Allergy IMR NIH Setia Alam	Request by Specialist (TTP)
6.	Allergic Disease Test: Tryptase	Serum	Plain tube	3ml	10 Days	Allergy Request Form	Allergy IMR NIH Setia Alam	<u>Timing of samples collection</u> 1) 1st sample within 15 min-3 hours after the symptoms onset. 2) 2nd sample after 24-48 hours to confirm the return to baseline levels 3) 3rd sample after 1-2 weeks if incidents of mastocytosis or other causes of elevated basal levels are suspected 4) Sample required other than anaphylaxis, as per clinician's request/ indication

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
	Autoimmune Disease Screening							
7.	**Anti Aquaporin 4** (AQ4) Neuromyelitis Optica (NMO) Test	CSF/ Serum	Bijou bottle/ Plain tube	5ml	10 Working Days	IMR Autoimmune form	Autoimmune IMR NIH Setia Alam	
8.	**Anti Cardiolipin Antibody** IgM & IgG (ACL)	Serum	Plain tube	Adult: 5ml Children: 3ml	14 Working Days	PER-PAT 301	Hospital Taiping	Keep at 2-8°C up to 48 hours, if more than 48 hours, frozen at -20°C.
9.	**Anti Glomerular Basement Membrane (GBM)** Test for Goodpasture's syndrome	Serum	Plain tube	5ml	10 Working Days	IMR Autoimmune Form	Autoimmune IMR NIH Setia Alam	
10.	Anti N-Nethyl-D-Aspartate Receptor (**NMDAR**)	Serum/ CSF	Plain tube/ Bijou bottle	5ml	7 Working Days	IMR Autoimmune Form	Autoimmune IMR NIH Setia Alam	
11.	Anti Nuclear Antibodies (**ANA**)	Serum	Plain tube	3.5ml	14 Working Days	PER-PAT 301	Hospital Taiping	Keep at 2-8°C up to 48 hours, if more than 48 hours, frozen at -20°C. Reflex Testing, will be done if ANA is Positive.
12.	**Anti-Acetylcholine Receptor Antibody (ACR)** Test for Myasthenia Gravis	Serum	Plain tube	5ml	21 Working Days	IMR Autoimmune form	Autoimmune IMR NIH Setia Alam	
13.	Anti-Beta 2 Glycoprotein 1 (**B2GP1**)	Serum	Plain tube	Adult: 3.5ml Children: 2ml	14 Working Days	PER-PAT 301	Hospital Taiping	Keep at 2-8°C up to 48 hours, if more than 48 hours, frozen at -20°C.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
14.	**Anti-Cyclic Citrullinated Peptide (Anti-CCP)** Test for Rheumatoid Arthritis	Serum	Plain tube	Adult: 3.5ml Children: 2ml	21 Working Days	PER-PAT 301	Hospital Taiping	Keep at 2-8 C up to 48 hours, if more than 48 hours, please frozen at -20 C.
15.	**Anti-Ganglioside Antibodies (GA)** Panel : ANTI GM-1, ANTI GM-2, ANTI GM-3, ANTI-GM4, ANTI-GD1a, ANTI-GD1b, ANTI-GD2, ANTI-GD3, ANTI-GT1a, ANTI-GT1b, ANTI-GQ1b	CSF Serum	Bijou Bottle Plain tube	5ml	14 Days	IMR Autoimmune Form	Autoimmune IMR NIH Setia Alam	
16.	**Anti-Neutrophil Cytoplasmic antibodies**: C-ANCA , P ANCA, ANTI MPO, ANTI-PR3	Serum	Plain tube	Adult: 3.5ml Children: 2ml	21 Working Days	PER-PAT 301	Hospital Taiping	
17.	**Coeliac Antibodies** Panel: Anti-endomysium, Anti Gliadin, Anti Tissue Transglutaminase	Serum	Plain Tube	5ml	21 Working Days	IMR Autoimmune Form	Autoimmune IMR NIH Setia Alam	
18.	**Cytokines Panel Interleukin 6** (IL-6): IL-1 beta, IL-6,IL-8 & TNF- alpha	Serum	Plain Tube	5ml	21 Days	IMR Autoimmune Form	Autoimmune IMR NIH Setia Alam	Ensure only SERUM is sent to IMR in ice. Call for appointment,
19.	Double Stranded DNA (**DsDNA**)	Serum	Plain tube	Adult: 3.5ml Children: 2ml	14 Working Days	PER-PAT 301	Hospital Taiping	Keep at 2-8°C up to 48 hours, if more than 48 hours, please frozen at -20°C.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
20.	**Extractable Nuclear Antigen (ENA)** (Sm, RNP, Ro52, Ro60, SS-B, Scl-70, Centromere, Jo-1 and Ribosomal-P)	Serum	Plain tube	3.5ml	14 working days	PER-PAT 301	Hospital Taiping	Keep at 2-8°C up to 48 hours, if more than 48 hours, please frozen at -20°C. **ANA must be Positive**.
21.	**Paraneoplastic Neurological Syndrome** Panel: Anti-Amphiphysin, Anti-Ma, Anti-Yo, Anti-Ri, Anti-Hu,Anti-CV2	Serum	Plain tube	5ml	14 days	IMR AUTOIMMUNE FORM	Autoimmune IMR NIH Setia Alam	Request by Specialist (TTP)
22.	Phospholipase A2 Receptor Antibody (anti-PLA2R)	Serum	Plain tube	5ml	21days	IMR AUTOIMMUNE FORM	Autoimmune IMR NIH Setia Alam	Send Immediately to the lab.
23.	Skin Antibodies Panel for Pemphigoid Diseases: Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3	Serum	Plain tube	5ml	14 days	IMR AUTOIMMUNE FORM	Autoimmune IMR NIH Setia Alam	Send Immediately to the lab.
24.	**Specific Liver Antibodies (SLA)** Panel: Primary Billiary CirrhosM2, Sp100, PML, gp210: Primary biliary cirrhosis LKM-1, SLA/LP, LC-1: Autoimmune hepatitis Ro-52	Serum	Plain tube	Adult: 3.5ml Children: 2ml	21 Working Days	PER-PAT 301	Hospital Taiping	**Must include AMA, ASMA, LKM results** attached/ written in history. Keep at 2-8^{0}C up to 48 hours, if more than 48 hours, please frozen at -20 C

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
25.	**Tissue Antibodies Panel:** Anti Mitochondrial Antibody-AMA, Anti Smooth Muscle Antibody-ASMA, Anti Parietal Cells Antibody-APC, Anti Liver Kidney Microsomal Antibody- LKM	Serum	Plain tube	Adult: 3.5ml Children: 2ml	21 Working Days	PER-PAT 301	Hospital Taiping	
26.	Amoebiasis PCR (*Entamoeba Histolytica*)	Whole Blood Pus Aspirate Biopsy Scrapings Stool	EDTA Sterile Container	2.5 ml	7 Days	IMR Parasitology Form	Parasitology IMR NIH Setia Alam	Send sample in ice *Subject to availability.
27.	Amoebiasis Serology IgG *(Entamoeba Histolytica*)	Serum, anti-coagulated blood	Plain Tube, EDTA tube	2ml	5 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	
28.	BK Virus PCR	CSF Serum Urine Stool Rectal	Bijou Bottle EDTA Plain tube Sterile Container	3.5ml	4 Weeks	Viral Encephalitis/ Meningjtis Form	MKA Ipoh Jelapang	Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
29.	Bordatella Pertussis PCR	Nasopharyngeal Aspirate/ NPA Swab	Dacron Swab in Stuart's Transport Media	1-2ml	5 Days	IMR / MKAI Bacteriology Request Form	**Diagnostic**: Bacteriology IMR **Outbreak**: MKA Ipoh	For nasopharyngeal swabs do not use calcium alginate or cotton swabs. Transport nasopharyngeal aspirate in ice.
30.	Brucella PCR	Blood	EDTA	5ml	5 Days	IMR Brucella Request Form	Bacteriology IMR NIH Setia Alam	Transport at 2-8°C. Must be fresh specimen, taken prior to antibiotic treatment. Laboratory must be informed prior to sending sample.
31.	Brucella Serology (ELISA)- Screening	Serum	Plain Tube	3.5ml	10 Days	IMR Brucella Request Form	Bacteriology IMR NIH Setia Alam	Transport at 2-8°C
32.	Chikungunya IgM / IgG	Serum	Plain Tube	3.5ml	4-5 Weeks	MKAI FORM/ PER-PAT 301	MKA Ipoh / Hospital Sungai Buloh	
33.	Chikungunya qRT-PCR	Serum	Plain Tube	3.5ml	4-5 Weeks	Virology Test Request Form/ PER-PAT 301	MKA Ipoh / IMR	
34.	Chikungunya Virus Isolation	Serum	Plain Tube	3.5ml	4-5 Weeks	MKAK Form	MKAK Sg Buloh	
35.	Chylamydia pneumonia IgA & IgM Serology	Serum	Plain Tube	3.5ml	2-4 Weeks	PER-PAT 301	Serology, HKL	

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
36.	Clostridium Difficile	Stool	Stool Container/ Cary Blair Media	10g	1 Day	PER-PAT 301	HRPB Ipoh	Ideal Specimens are less than 24 hours old
37.	CMV DNA PCR	Serum	Plain Tube	5ml	4-5 Weeks	MKAI FORM	MKA Ipoh Jelapang	Request by Specialist (TTP)
38.	Coxiella Burnetti (Q-Fever) Serology	Serum	Plain Tube	3.5ml	5 Working Days	PER-PAT 301	Bacteriology IMR NIH Setia Alam	Subject to availability
39.	Dengue (Virus Isolation And Serotyping)	CSF Serum Plasma Tissue Biopsy Organ Biopsies Autopsy	Bijou Bottle Plain Tube EDTA Sterile Container	Serum/ Plasma 1-3mls Organs: 1.5cm cube	4-5 Weeks	MKAK Form	MKAK	POST MORTEM ONLY
40.	Dengue ELISA	Serum	Plain Tube	3ml	3 Days	PER-PAT 301	HRPB	Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
41.	Dengue PCR	Serum, Blood Organ Biopsies, CSF	Plain Tube VTM Bijou Bottle	Serum/ Plasma 1-3mls Organs: 1.5cm cube	4-5 Weeks	PER-PAT 301	MKA Ipoh Jelapang	Request by Specialist (TTP) NS1 **MUST** be POSITIF.
42.	EBV PCR	CSF, SERUM	Bijou Bottle Plain Tube	3.5ml	14 Working Days	ViraL Encephalitis Meningitis Investigation request form	MKA Ipoh Jelapang	Request by Specialist (TTP)
43.	EBV Rapid Test Monospot Indirect Immunoperoxidase	Serum	Plain Tube	3.5ml	1 Working Day	PER-PAT 301	HRPB	Request by Specialist (TTP)
44.	Epstein–Barr virus (EBV) IgM, IgG	Serum	Plain Tube	3.5ml	1-2 Weeks	PER-PAT 301	Serology, HKL	
45.	Echinococcosis Serology for Hydatid Disease/ Echinococcosis	Serum, anti-coagulated blood	Plain Tube EDTA	3ml	5 Working Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Clinical symptoms and/or history of exposure to infection source, medical preliminary screening for going overseas. Packed in ice Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
46.	Enterovirus PCR (Enterovirus 71, Coxsackie A and Coxsackie B, Echovirus,Other non enteroviruses)	CSF Blood Serum Pleural Fluid Eye Stool Rectal,/ Throat/ Vesicle/ Ulcer swab	Bijou Bottle EDTA Plain Tube Sterile Container/ swab in VTM	Blood/ Serum/ Fluid: 3ml VTM: 3ml Stool: 5g	4-5 Weeks	MKAI FORM PER-PAT 301	MKA IPOH	Request by Specialist (TTP)
47.	Filariasis Serology IgG Antibody	Serum Anti-coagulated blood	Plain Tube EDTA	3ml	5 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Type of patient: Clinical symptoms without parasitemia, difficulties in taking blood at night, infection at patent stage (adult worm still alive) Send sample in ice
48.	Fungal PCR	Blood/ Serum CSF Sterile Body Fluids Tissue biopsies FFPE	Bijou Bottle EDTA Plain Tube Sterile Container	3ml	10 Days	PER-PAT 301	Bacteriology IMR NIH Setia Alam	Fresh clinical specimens required.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
49.	Galactomanan Antigen Detection (Aspergillus)	Serum, CSF	Bijou Bottle Plain Tube	2-3ml	5 Days	PER-PAT 301	Hospital Sungai Buloh	
50.	Gastrointestinal protozoa (PCR) – Include 6 pathogen : Blastocyctis homonis, Cryptosporidium spp, Cyclospora cayetanensis, Dientamoeba fragilis, Entamoeba histolytica Giardia lamblia	Stool	Stool Container	6g	5 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Fresh stool in plain container (specimen to reach lab within 24hr at room temperature) (Before REFERRAL, Initial ID parasite to determine by customer)
51.	Gene expert (TB)	Sputum, CSF, Gastric Lavage, Body Fluid	Bijou Bottle, Sterile container	Sputum: 1 to 5 ml. CSF/ Body Fluids/ Gastric Lavage: 1 to 5 ml	1 Working Days	TIBIS-10 / PER-PAT 301 (2copy)	HRPB	Request by Specialist (TTP) Specimens containing Saliva or blood stained will be **REJECTED**. Please make sure specimen do not contain any food particle or foreign body. All samples must be sent on ice, chilled 2-8 °C
52.	Hanta Renal Syndrome (Seoul & Hantaan Virus)	After consultation only	After consultation only	After consultation only	1 - 5 days	Virology Request Form/ PER-PAT 301	Virology IMR NIH Setia Alam	Request by Specialist (TTP) Availability by Consultation with Virology IMR Only

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
53.	Helminth culture – Used for hookworm, Strongyloides spp. diagnosis	Fresh stool not fixed	Sterile Stool container	5g	14 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Type of patient: RVD, low immunity, Specimen to reach lab within 24hr at room temperature
54.	Hepatitis B Virus (HBV) DNA Viral Load	Blood	4 EDTA	3.5ml	4-5 Weeks	PER-PAT 301	Hospital Pulau Pinang	Request by Specialist (TTP)
55.	Hepatitis C (HCV) Genotype	Plasma	EDTA	3.5ml	4-5 Weeks	PER-PAT 301	Serology HKL	Request by Specialist (TTP) Must have Hep C Viral Load result (min 1000iu/mL) & Relevant clinical history. Test request will be screened by Clinical Microbiologist.
56.	Hendra Virus PCR	CSF, SERUM, URINE, THROAT SWAB	Bijou Bottle Plain Tube Sterile container	3.5ml	4-5 Weeks	MKAI Form	Mka Ipoh Jelapang	Request by Specialist (TTP)
57.	Hepatitis A (Anti HEP-A Total Antibody)	Serum	Plain Tube	3ml	4-5 Weeks	PER-PAT 301	HKL	
58.	Hepatitis A IgM Virus Antibody	Serum	Plain Tube	3ml	4-5 Weeks	PER-PAT 301	HRPB	

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
59.	Hepatitis A PCR	Serum Stool	Plain Tube Stool Container	Blood: 3ml Stool: 5g	4-5 Weeks	MKAK Form	MKA Sungai Buloh	
60.	Hepatitis B Core IgM (HBc) Antibody	Serum	Plain Tube	3ml	4-5 Weeks	PER-PAT 301	HRPB	
61.	Hepatitis Be Antibody & Antigen	Serum	Plain Tube	3ml	4-5 Weeks	PER-PAT 301	HRPB	
62.	Hepatitis C Antigen	Serum	Plain Tube	3ml	4-5 Weeks	PER-PAT 301	HKL	
63.	Hepatitis C Viral Load	Plasma	EDTA	3ml	4-5 Weeks	PER-PAT 301	Hospital Pulau Pinang	Request by Specialist (TTP)
64.	HFMD (Virus Isolation) . Enterovirus, Coxsackie, Echovirus, Poliovirus, HSV	CSF Blood/ Serum Pleural Fluid Eye Stool Rectal,/ Throat/ Vesicle/ Ulcer swab	Bijou Bottle EDTA Plain Tube Sterile Container/ swab in VTM	Blood/ Serum/ Fluid: 3ml VTM: 3ml Stool: 5g	4-5 Weeks	MKAI FORM Borang Permohonan Ujian Makmal HFMD PER-PAT 301	MKA IPOH	Request by Specialist (TTP)
65.	HIV AG P24 Confirmation/ Genotyping	Serum	Plain Tube	3.5ml	2-4 Weeks	PER-PAT 301	HKL	BY APPOINTMENT

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
66.	HIV Drug Resistance Test (PCR AND SEQUENCING)	Plasma	EDTA 3 TUBES	5-10ml	40 working days	IMR/Viro/ HIV/2 form	Virology IMR NIH Setia Alam	Request by Specialist (TTP) Treatment failure patient's viral load m ust be > 1000. Transport in DRY ICE
67.	HIV Immunoassay (LIA)	Plasma	EDTA	3ml	4-5 Weeks	PER-PAT 301	Hospital Pulau Pinang	Request by Specialist (TTP) Confirmation For HIV Antibody After PA Positive
68.	HIV-2 qRT-PCR	Plasma	2 EDTA	3ml	5 Working Days	IMR/Viro/HIV/2 form	Virology IMR NIH Setia Alam	Transport in ice
69.	HIV Viral Load	Plasma	EDTA 4 TIUB	10ml	4-5 Weeks	PER-PAT 301	Hospital Pulau Pinang	Request by Specialist (TTP) * FORM 3 COPY
70.	HIV-1 RNA RT PCR for babies (0-18 months)	Plasma	EDTA	3ml	5 Working Days	IMR/Viro/ HIV/2 form	Virology IMR NIH Setia Alam	Request by Specialist (TTP) Transport In Ice Mother **MUST** be HIV Positive

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
71.	Herpes Simplex viruses (HSV) qPCR	CSF Serum Swab from Mouth ulcer, Skin lesion, Nasopharyngeal, Rectal, Eye,Genital, BAL, NPA, Tracheal Aspirate	Plain Tube Sterile container with VTM	Blood/ Fluid: 3ml Sterile container with 2.0-2.5 ml of VTM	3 Days	MKAK Form/ PER-PAT 301	MKA Ipoh Jelapang	Request by Specialist (TTP) Sample should be collected within 5 days from onset of illness. Complete history in Form Transport In Ice
72.	HSV 1 & 2 Serology IgG AB	Serum	Plain Tube	3.5ml	1-2 Weeks	PER-PAT 301	Serology, HKL	For transplant cases only. By request with Clinical Microbiologist. Request by Specialist (TTP)
73.	HSV 1 & 2 Serology IgM	Serum	Plain Tube	3.5ml	1 Weeks	PER-PAT 301	HRPB	Request by Specialist (TTP)
74.	Human T-Lymphotropic Virus (HTLV) 1/2	Serum	Plain Tube	3.5ml	1-2 Weeks	PER-PAT 301	Serology, HKL	Request by Specialist (TTP)
75.	Human Leukocytes Antibody Typing (HLA Antibody)	Whole Blood	2 EDTA Bottle	10mL	4-5 Weeks	HLA ANTIBODY test FORM	Transplantation Immunology IMR NIH Setia Alam	Request by Specialist (TTP) Must Reach Lab by 9.30AM.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
76.	HLA Cross matching	Blood	Donor: Sodium Heparin. Patient: plain tube	Donor: 18ml Patient: 5 ml	10 Days	HLA Cross Matching Request form	Transplantation Immunology IMR NIH Setia Alam	Request by Specialist (TTP) If patient is anaemic, TWBC less than 1.5 x 10^3 cells per ml we require 15 ml of blood. Patient must not have had a transfusion in the 3 weeks preceding blood collection. • The blood must be sent at room temperature and reach the laboratory by 9.30 am
77.	Human Leukocytes Antigen Typing (HLA Typing)	Blood	2 EDTA Bottle	6mL	4-5 Weeks	HLA TYPING Test FORM	Transplantation Immunology IMR NIH Setia Alam	Request by Specialist (TTP) By Appoinment. Must Reach Lab by 9.30AM.
78.	Human Parechovirus HPeV	CSF, Throat Swab, Fresh Stool, Rectal Swab	Bijou Bottle Sterile Container	3ml	1 Month	MKAI Form	MKA Ipoh Jelapang	Request by Specialist (TTP)
79.	Indirect Immunoperoxidase Rickettsial Test (IIP) Scrub thypus	Serum	Plain Tube	3ml	1 Weeks	PER-PAT 301	HRPB	
80.	Intrinsic Factor	Serum	Plain Tube	3ml	1 Month	PER-PAT 301	Hospital Selayang	Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
81.	Japanese Encephalitis (JE) Serology IgM	Serum	Plain Tube	3ml	7 Days	IMR Virology Form	MKA Ipoh Jelapang	Request by Specialist (TTP)
82.	Japanese Encephalitis (JE) Virus PCR	Serum CSF	Plain Tube Bijou Bottle	Serum:4ml CSF: 1ml	3-7 Days	IMR Virology Form	MKAK Sungai Buloh	Request by Specialist (TTP) Sample should be collected within 5 days from onset of illness. Transport in ice
83.	Legionella pneumophilia Antigen Detection	Urine	Sterile Container	5ml	4-5 Weeks	PER-PAT 301	HKL	**ONLY** Urine sample is accepted Request by Specialist (TTP)
84.	Leishmaniasis PCR	Whole Blood Skin / Tissue Scrappings	EDTA Filter Paper, Sterile Container	2.5ml	10 Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Subject to availability
85.	Leishmaniasis Serology IgG Antibody	Serum, anti-coagulated blood	Plain Tube, EDTA tube	2ml	5 days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Send sample in ice
86.	Leprosy PCR & LPA	Skin Incision / Punch Biopsy	Sterile container without Preservative /In container with 70% ethanol	Minimum 4 mm x 12 mm (skin incision) / Minimum 5 mm (punch biopsy).	7-14 Days	MKAK Leprosy Form PER-PAT 301	MKAK Sungai Buloh	70% Ethanol - No cold chain needed if taken in ethanol. (sample in normal saline accepted, only if could reach MKAK within 48hrs)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
87.	Leptosoiral Microagglutination Test (MAT)	Serum	Plain Tube	3ml	7 Days	MKA Form	MKA Ipoh Jelapang	Lepto Serology must be Positive.EXCEPT for ICU cases,
88.	Leptosoiral PCR (NICU/URGENT)	NPA Aspirate Or Amies Clear Swab	Sterile Container Amies Clear	NA	By Request	MKA Form	MKAK Sungai Buloh	Request by Specialist (TTP)
89.	Leptosoiral rtPCR	Whole blood, CSF BODY FLUID	EDTA Bijou Bottle Sterile Container	3ml	5 Days	PER-PAT 301	MKA Ipoh Jelapang	Plasma will be rejected Only EDTA accepted Send immediately after collection at 2°C – 8°C
90.	Leptosoiral Serology IgM	Serum	Plain Tube	3ml	2 Working Days	PER-PAT 301	HRPB	
91.	Lymphocytic Choriomeningitis Virus (LCMV) PCR	CSF Serum Urine	Bijou Bottle EDTA Sterile Container	3ml	1 Month	MKA Form PER-PAT 301	MKA Ipoh Jelapang	
92.	Malaria PCR Plasmodium DNA	Blood Dried Blood Spot (DBS)	EDTA Filter paper (Whatman No 1/ 3mm)	Blood: 3-5ml DBS: 50 ul of fresh blood in each spot (3 spot)	3 Days	PER-PAT 301	MKA Ipoh Jelapang	Keep and transport specimen at 2-8°C

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
93.	Measles IgG, IgM	Serum	Plain Tube	3ml	4-5 Weeks	MKAI Measles Form	MKA Ipoh Jelapang	Request by Specialist (TTP)
94.	Measles RT-PCR	CSF Serum Urine Nasopharyngeal secretion Tracheal aspirate	Bijou Bottle Plain Tube Sterile Container	Serum: 2-4ml Urine: 10ml of (Early morning first void) Others: 3ml	14 Days	MKAI Measles Form	MKAK Sungai Buloh	Request by Specialist (TTP) Blood/serum should be taken any time up to 28 days of rash onset. Respiratory secretion should be taken 1 – 5 days of rash onset. Respiratory secretion (nasopharyngeal specimen) should be taken 1 – 7 days of rash onset. Transport in ice.
95.	Meliodosis (Burkholderia Pseudomallei Ab IgM)	Serum	Plain Tube	3ml	7 Days	PER-PAT 301	Bacteriology IMR NIH Setia Alam	Transport at ambient temperature; if delayed keep at 2-8°C
96.	MersCov	NPA SWAB Sputum Tracheal Aspirate Throat Swab Lungs tissue biopsy / autopsy	Sterile container Swab in VTM using dacron swab.	3ml Biopsy: 1.5cm^3 in a few drops of VTM	1 Working Day	MersCov Request Form	HRPB	Laboratory must be informed prior to sending sample.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
97.	Mumps Virus Virus Isolation/ qRT-PCR	Oral or buccal swab Saliva	Sterile Container with VTM	VTM 2.0-2.5 ml Saliva: 3-5ml	Virus Isolation: 21 days qRT-PCR: 3 days	MKAK FORM	MKAK Sungai Buloh MKA Ipoh (PCR Only)	Sample should be collected within 5 days from onset of illness. Transport in ice.
98.	Mumps Virus qRT-PCR	Oral or buccal swab Saliva	Sterile Container	Swab: 2.0-2.5 ml of VTM Saliva: 3-5ml	3 days	MKA FORM	MKA Ipoh Jelapang	Sample should be collected within 5 days from onset of illness. Transport in ice.
99.	Mumps Serology IgM, IgG	Serum	Plain Tube	3ml	14 Days	PER-PAT 301	Hospital Sungai Buloh	Store at 4^0C-8^0C and transport at ambient temperature if able to reach the lab within 24 hours
100.	Mycobacterium tuberculosis complex (MTBC) LPA	Sputum	Sterile Container	3-5ml	2 Weeks	TBIS 20C	MKA Ipoh Jelapang	Request by Specialist (TTP) Specimens should be kept cool during transportation but not frozen.
101.	Mycobacterium tuberculosis complex (MTBC) PCR	CSF Sputum Gastric lavage, BAL, Pus Urine, Tissue Biopsy Blood, Bone Marrow Autopsy	CSF: Bijou Bottle Plain Tube Sterile Container	CSF: min 0.5ml Others: 3-5ml	7 Working Days	TBIS 20C	MKA Ipoh Jelapang	Specimens should be kept cool during transportation but not frozen. NO preservatives should be used in any sample.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
102.	Mycobacteria Other Than Tuberculosis (MOTT) / Atypical Mycobacterium infection PCR (NON-TB PCR)	Sputum, pus, tissue, stool, FFPE block, CSF & other body fluids	Sterile Container	CSF 1-2 ml	10 Days	TBIS 20C MOTT Form	Bacteriology IMR NIH Setia Alam / MKAK Sungai Buloh	Request by Specialist (TTP) For CSF send to lab immediately; for sputum ideally collect 3 consecutive specimens. A single well collected specimen is adequate.
103.	Nipah Virus PCR	CSF, Serum, Urine, Throat Swab Tissue biopsy / autopsy	Bijou Bottle Plain Tube Sterile Container	3ml Sterile container with 2.0-2.5 ml of VTM	3 Days	MKAI Form	MKA Ipoh Jelapang	Request by Specialist (TTP) Sample should be collected within 5 days from onset of illness.
104.	Parvovirus B19 PCR & Serology IgM/ IgG	Serum Bone marrow aspirate CSF	Bijou Bottle Plain Tube Sterile Container	CSF: 1ml Serum/ BMA: 3ml	PCR: 3 Days Serology: 3 Weeks	MKAI FORM	MKA Ipoh Jelapang	Request by Specialist (TTP) Sample should be collected within 5 days from onset of illness. Transport at 2-8°C
105.	Pneumocystis Jiroveci Oocyst Detection Pneumocystis Carinii Pneumonia (PCP Stain)	Sputum, BAL	Sterile Container	3-5ml		PER-PAT 301	Hospital Sungai Buloh	Request by Specialist (TTP)

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
106.	Primary and Secondary Immunodeficiency Test: Dihydrorhodamine Assay (DHR) for Chronic Granulomatous Disease (CGD)	Blood	Lithium Heparin	2.5ml	4 Weeks	PID Form	PID IMR NIH Setia Alam	Must be tested for Phagocytic function Test. Transport specimen at ambient temperature; Not in ice. By Appointment only.
107.	Primary Immunodeficiency Test: Lymphocyte Subset Enumeration Test (TBNK)	Blood	EDTA	2ml	5 Days	PID Form	PID IMR NIH Setia Alam	By appointment only
108.	Primary & Secondary Immunodeficiency Test: Lymphocyte Activation Test	Blood	EDTA	5ml	10 days	PID Form	PID IMR NIH Setia Alam	By appointment and consultation only (A healthy control sample is required to assist with interpretation)
109.	Rabies PCR	Saliva Skin biopsy of the hair follicles (at the nap of the neck) Brain autopsy	Sterile Container	Fluid: 1-3 ml Tissue: 1.5cm cube in a few drops of VTM	3 Days	MKAI FORM	MKA Ipoh Jelapang	Request by Specialist (TTP) Sample should be collected within 5 days from onset of illness.

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
110.	Respiratory Virus Isolation (Influenza A&B,Parainfluenza 1,2&3, Adenovirus and Respiratory Syncytial Virus)	Sputum NPA, BAL Tracheal Aspirates Throat/ Nasal/ Eye Swab	Swab in VTM Medium. Others: Sterile Container	Specimen: 2-4ml VTM: 2.5ml	1 Day	PER-PAT 301	HRPB	
111.	Respiratory Virus Antigen Identification (Influenza A, B; Parainfluenza 1,2,3, Adenovirus, RSV and Metapneumovirus)	NPA Nasopharyngeal/ Throat/ Nasal Swab Throat gargle	Swab in VTM Medium. Others: Sterile Container	2-3ml of VTM For all Swab and Sterile Container	1-10 days	Virology Request Form	Virology IMR NIH Setia Alam	
112.	Rickettsia PCR Scrub Thypus	Blood Tissue Biopsies	EDTA Sterile Container	After consultation only	5 Working Days	IMR Rickettsia Request Form	Bacteriology IMR NIH Setia Alam	Obtain specimen before antibiotics. For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval. Transportation at ambient temperature. If delayed keep at 2-8°C
113.	Rotavirus	Stool	Stool Container	5g	1-3 Working Day	PER-PAT 301	**PCR** MKA Ipoh **Rapid Test** HRPB	

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
114.	Rubella PCR	Serum Urine Throat swab Nasopharyngeal secretion Tracheal aspirate	Plain Tube Sterile Container with VTM	Serum/ fluid: 3ml Urine: 10 ml of urine (Early morning first void) VTM: 2.5 ml of	14 Days	PER-PAT 301	MKA Ipoh Jelapang	Request by Specialist (TTP) Transportation at ambient temperature. If delayed keep at 2-8°C
115.	Rubella IgG	Serum	Plain Tube	5ml	14 Days	PER-PAT 301	HKL	Request by Specialist (TTP) Transportation at ambient temperature. If delayed keep at 2-8°C
116.	Schistosomiasis Serology IgG Antibody	Serum Anti-coagulated blood	Plain Tube, EDTA	2ml	5 Working Days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Clinical symptoms and/or history of exposure to infection source, medical preliminary screening for going overseas. Send sample in ice
117.	Taeniasis / Cysticercosis Serology	Serum, Anti-coagulated blood	Plain Tube EDTA	3ml	5 Day	PER-PAT 301	Parasitology IMR NIH Setia Alam	Clinical symptoms and/or history of exposure to infection source, medical preliminary screening for going overseas. Send sample in ice
118.	**TORCHES** Serology Toxoplasmosis, Syphilis, Hepatitis B, Rubella, Cytomegalovirus (CMV), and Herpes Simplex.	Serum	Plain Tube	3.5ml	1 Week	PER-PAT 301	HRPB	

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
119.	Toxocariasis Serology	Serum, Anti-coagulated blood	Plain Tube EDTA	3ml	5 Day	PER-PAT 301	Parasitology IMR NIH Setia Alam	Type of patient: Asthma / difficulty in breathing, have history of exposure to infection source Send sample in ice
120.	Trichinellosis Serology	Serum, Anti-coagulated blood	Plain Tube EDTA	3ml	5 days	PER-PAT 301	Parasitology IMR NIH Setia Alam	Clinical symptom and/or history of exposure to infection source, medical preliminary screening for going overseas. Send sample in ice
121.	Varicella Zoster PCR	CSF Serum Swab from Throat/ Oral/Vesicle / crusts from lesions	Bijou Bottle Plain Tube Vesicular fluid: collect with polyester swab	CSF2ml Serum: 3ml	3 Days	Meningitis : MKAI FORM Others: PER-PAT 301	MKA Ipoh Jelapang	Do not place transport medium into the tube; the specimen MUST be kept dry Request by Specialist (TTP)
122.	Varicella Zoster Serology IgM / IgG	Serum	Plain Tube	3.5ml	7-14 Days	PER-PAT 301	Microbiology HKL	Room Temperature / Ice
123.	VDRL	CSF	Bijou Bottle	3ml	7-14 Days	PER-PAT 301	Microbiology HKL	Room Temperature / Ice
124.	Zika Virus PCR	CSF Serum.	Bijou Bottle Plain Tube	CSF: 1ml Serum: 4ml	3 Days	MKAK FORM	MKAK Sungai Buloh	

No	Test	Specimen Type	Container	Volume	LTAT	Form	Location	Remarks/ Test Requirements
125.	Zika Virus PCR Nucleic Acid	CSF Tissue Amniotic fluid Vaginal secretion	Bijou Bottle Sterile container & Swab containing VTM to keep tissue moist	After consultation only	1 - 5 Days	Virology Request Form/ PER-PAT 301	Virology IMR NIH Setia Alam	Test request upon consultation only. Type of specimen, container and volume must be determined upon consultation. Request by Specialist (TTP)
126.	(1,3)-Beta-D-Glucan Antigen test. Test for invasive fungal disease	Serum	Plain Tube	3ml	1 Month	PER-PAT 301	Hospital Sungai Buloh	Request by Specialist (TTP) Test offered for ICU Patients.only

TRANSFUSION MEDICINE REFERRED TEST
(ACCORDING TO ALPHABETICAL ORDER)

NO	UJIAN	SAMPEL	TIUB	KUANTITI	BORANG	LTAT/ CATATAN
1	RBC Phenotyping	Blood	EDTA	9.0-10.0mLs	PER - PAT 301	14 hari (hari bekerja)
2	Antibody Identification	Blood	EDTA	9.0-10.0mLs	PER - PAT 301	14 hari (namun bergantung kepada jenis antibodi tersebut)
3	Platelet Immunology Test	Blood	Bergantung kepada indikasi ujian yang dikehendaki (rujuk PDN/IH/QP-05/02, ver 01 di laman web Pusat Darah Negara)		PDN/IH/QP-05/02, ver 01 (download di laman web Pusat Darah Negara)	14 hari (namun bergantung kepada jenis antibodi tersebut)
4	RBC Genotyping	Blood	EDTA	4.0mLs	PER - PAT 301 dan PDN/IH/QP-05/01, ver 01 (download di laman web Pusat Darah Negara)	14 hari (namun bergantung kepada jenis antibodi tersebut)
5	Antibody Identification and Crossmatching	Blood	EDTA	9.0-10.0mLs	PER - PAT 301 Dan PER-SS-BT105 (Pind 1/2016)	14 hari (namun bergantung kepada jenis antibodi tersebut)
6	Antibody Titre	Blood	EDTA	9.0-10.0mLs	PER - PAT 301	14 hari (namun bergantung kepada jenis antibodi tersebut)
7	Iso Haemagglutinin Titre	Blood	EDTA	9.0-10.0mLs	PER - PAT 301	14 hari (namun bergantung kepada jenis antibodi tersebut)

GENETICS REFERRED TEST
(ACCORDING TO ALPHABETICAL ORDER)

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
CYTOGENETICS								
1	Hemato-Oncology Conventional Cytogenetics	Bone marrow (First aspirate)	Sodium heparin	3-5 ml	Urgent: 10 working days Routine: 30-60 days FISH: Additional 30 days from reflex testing	Cytogenetics Request Form	Cytogenetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container. Reflex testing: Constitutional molecular cytogenetic fluorescence in situ hybridization (FISH) is done if indicated
2	Hemato-Oncology Conventional Cytogenetics (CLL only)	Peripheral Blood (CLL only)	Sodium heparin	3-5 ml				
3	Solid Tumour molecular cytogenetic fluorescence in situ hybridization (FISH)	Paraffin Block	Suitable container	≥ 70% tumour cells or ≥ 50% tumour cells	3-6 months	Molecular Tests Request Form	Cytogenetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible
		Slide	Plastic slide holder	5-10 unstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness				

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
4	Array comparative genomic hybridization	Peripheral Blood	EDTA	3-5 ml x 2	3-6 months	Cytogenetics Request Form	Cytogenetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
MOLECULAR GENETICS								
5	Duchenne muscular dystrophy	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
6	Becker muscular dystrophy	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
7	Muenke syndrome	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
8	Rett syndrome	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
9	Beckwith Wiedemann Syndrome	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
10	Russell Silver Syndrome	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
11	Y microdeletion	Peripheral blood	EDTA	3-5ml x2	3-6 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory within 48 hours after sample collection in an ice-packed container.
CANCER GENETICS								
12	Lung cancer targeted gene panel	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible
		Slide	Plastic slide holder	5-10 unstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness				
13	Lung cancer (EGFR mutation testing)	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
13	Lung cancer (EGFR mutation testing)	Slide	Plastic slide holder	5-10 u nstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible
14	Colorectal cancer (KRAS mutation testing)	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible
		Slide	Plastic slide holder	5-10 unstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness				
14	Colorectal cancer (Microsatellite Instability Analysis)	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
15	Colorectal cancer (Microsatellite Instability Analysis)	Slide	Plastic slide holder	5-10 unsTained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness	3 months	Molecular Tests Request Form	Molecular genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible
16	Brain Cancer (1p19q co deletion)	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible.
		Slide	Plastic slide holder	5-10 unstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness				
17	Brain Cancer (IDH1/IDH2 mutation)	Paraffin Block	Suitable container	≥70% tumour cells or ≥50 tumour cells	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible.

No:	Test	Specimen type	Container	Volume	TAT	Form	Location	Remarks/ Test requirement
18	Brain Cancer (IDH1/IDH2 mutation)	Slide	Plastic slide holder	5-10 unstained slides and 1 H&E stained slide of biopsied tissue cut at 5µm thickness	3 months	Molecular Tests Request Form	Molecular Genetic Lab, HTA	Test should be requested by specialist only Sample must reach HTA Genetic Laboratory as soon as possible.

MOLECULAR DIAGNOSTIC SERVICES, UNIT OF MOLECULAR DIAGNOSTICS, SPECIALIZED DIAGNOSTICS CENTRE, IMR JALAN PAHANG KL

a. **Active by consultation only. Please call 03-26162783/ 2581/2707**
b. **Use special form: IMR - Request Form for Molecular Diagnostic Services + Informed Consent Form**
c. All cases must be referred to a Clinical Geneticist/ Neurologist and they must endorse the test before any sample submission.
d. Samples received without referral by Clinical Geneticist/ Neurologist will be rejected.
e. 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.
f. Please send the samples according to the criteria for samples collection.
g. Kindly ensure samples are sent together with both the request form and informed consent form.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
1	Acute Intermittent Porphyria (*HMBS*)- Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
2	Acute Intermittent Porphyria (HMBS)- Deletion/Duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
3	Alagille Syndrome (*JAG1*)- Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
4	Alagille Syndrome (JAG1)- Deletion/Duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
5	Alexander Disease (*GFAP*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
6	*SERPINA1*	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
7	Angelman Syndrome (*SNRPN*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
8	Angelman Syndrome (*UBE3A*) - Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
9	Argininosuccinate Lyase Deficiency (*ASL*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
10	Argininosuccinate Synthase Deficiency (*ASS1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
11	Aromatic Amino Acid Decarboxylase Deficiency (*DDC*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
12	Berardinelli Congenital Lipodystrophy (*AGPAT2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
13	Berardinelli Congenital Lipodystrophy (*BSCL2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
14	Biotinidase Deficiency (*BTD*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
15	CADASIL (*NOTCH3*) - Hotspots	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
16	Canavan Disease (*ASPA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
17	Carbamoyl Phosphate Synthetase 1 Deficiency (*CPS1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
18	Carnithine Uptake Deficiency (*OCTN2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
19	Carnithine-Acylcarnitine Translocase Deficiency (*SLC25A20*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
20	Carnitine Palmitoyltransferase 1 Deficiency (*CPT1A*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
21	Carnitine Palmitoyltransferase 2 Deficiency (*CPT2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
22	Citrin Deficiency (*SLC25A13*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
23	Classical Galactosemia (*GALT*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
24	Homocysteinuria (*CBS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
25	Dihydropyriminidase Deficiency (*DPYS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
26	DNA Extraction and storage	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	5 days	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
27	Ethylmalonic Encephalopathy (*ETHE1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
28	Fragile X Syndrome (FRAXA)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
29	Fructose-1,6-Bisphosphatase Deficiency (*FBP1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
30	Fucosidosis (*FUCA1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
31	Floating Harbor Syndrome (*SRCAP*) - Hotspots	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
32	Galactokinase Deficiency (*GALK1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
33	Galactosemia Epimerase Deficiency (*GALE*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
34	Gaucher Disease (*GBA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
35	Glutaric Aciduria Type 1 (*GCDH*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
36	Glycogen Storage Disease Type 1a (*G6PC*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
37	Glycogen Storage Disease Type 1b (*SLC37A4*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
38	Glycogen Storage Disease Type III (*AGL*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
39	Hereditary Orotic Aciduria (*UMPS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
40	Hypophosphatasia (*ALPL*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
41	Leber Hereditary Optic Neuropathy (LHON) Syndrome	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
42	Leigh Syndrome (*SURF1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
43	Leigh Syndrome (8993 hotspot)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	1 month	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
44	Leigh Syndrome (mtDNA Full Panel)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
45	Leopard Syndrome (*PTPN11*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
46	Lesch-Nyhan Syndrome (*HPRT1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
47	Lissencephaly (*DCX*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
48	Lissencephaly (*LIS1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
49	Long-Chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency (*HADHA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
50	Lysinuric Protein Intolerance (*SLC7A7*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
51	Maple Syrup Urine Disease (*BCKDHA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
52	Maple Syrup Urine Disease (*BCKDHB*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
53	Maple Syrup Urine Disease (*DBT*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
54	Maple Syrup Urine Disease (*DLD*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
55	Maroteaux-Lamy Syndrome, MPS VI (*ARSB*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
56	MCT8-Specific Thyroid Hormone Cell Transporter Deficiency (*SLC16A2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
57	Medium Chain Acyl-CoA Dehydrogenase (*ACADM*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
58	Metachromatic Leukodystrophy (MLD)/ Arylsulphatase A (*ARSA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
59	Methylenetetrahydrofolate Reductase Deficiency (*MTHFR*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
60	Methylmalonic Acidemia (*MMAA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
61	Methylmalonic Acidemia (*MMAB*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
61	Methylmalonic Acidemia (M*MUT*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
63	Methylmalonic Aciduria and Homocystinuria Type C (*MMACHC*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
64	Methylmalonic Aciduria and Homocystinuria Type D (*MMADHC*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
65	Methylmalonyl-CoA Epimerase Deficiency (*MCEE*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
66	Mitochondrial DNA Deletion Syndromes - Kearns-Sayre Syndrome (KSS)	Muscle biopsy/ Urine sediment/ Blood	EDTA tube Universal container	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
67	Mitochondrial DNA Deletion Syndromes - Pearson Syndrome	Muscle biopsy/Urine sediment/Blood	EDTA tube Universal container	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
68	Mitochondrial DNA Deletion Syndromes - Chronic Progressive External Ophthalmoplegia (CPEO)	Muscle biopsy/Urine sediment/Blood	EDTA tube Universal container	Muscle biopsy/ urine sediment (10-20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
69	Mitochondrial DNA Depletion Syndromes (*ANT1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
70	Mitochondrial DNA Depletion Syndromes (*DGUOK*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
71	Mitochondrial DNA Depletion Syndromes (*MPV17*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
72	Mitochondrial DNA Depletion Syndromes (*POLG*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
73	Mitochondrial DNA Depletion Syndromes (*RRM2B*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
74	Mitochondrial DNA Depletion Syndromes (*SUCLA2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
75	Mitochondrial DNA Depletion Syndromes (*SUCLG1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
76	Mitochondrial DNA Depletion Syndromes (*TWINKLE*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
77	Mitochondrial DNA Depletion Syndromes (*TYMP*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
78	Mitochondrial Neurogastrointestinal Encephalopathy (*TYMP*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
79	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (3243 hotspot)	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine)/muscle biopsy	1 month	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
80	Mitochondrial Encephalomyopathy, Lactic Acidosis, and Stroke-Like Episodes (MELAS) Syndrome (Full Panel)	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine)/muscle biopsy	3 months	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
81	Mitochondrial HMG-CoA Synthase Deficiency (*HMGCS2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
82	Mitochondrial Short-Chain Enoyl-CoA Hydratase 1 Deficiency (*ECHS1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
83	Morquio A Disease (*GALNS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
84	Multiple Respiratory Chain Deficiencies (Mitochondrial Translation Defect) (*GFM1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
85	Myoclonic Epilepsy with Ragged-Red Fibers (MERRF) Syndrome (8344 hotspot)	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine)/muscle biopsy	1 month	Molecular Diagnostic IMR Jalan Pahang KL	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.
86	N-Acetylglutamate Synthase Deficiency (*NAGS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
87	Neuropathy, Ataxia and Retinitis Pigmentosa (NARP) Syndrome (8993 hotspot)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	1 month	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
88	Non Ketotic Hyperglycinemia (*AMT*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
89	Non Ketotic Hyperglycinemia (*GCSH*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
90	Non Ketotic Hyperglycinemia (*GLDC*)-Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
91	Non Ketotic Hyperglycinemia (GLDC)-Deletion/duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
92	Noonan Syndrome (*PTPN11*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
93	Ornithine Transcarbamylase Deficiency (*OTC*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
94	Phosphomannomutase 2 Deficiency (*PMM2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
95	POLG-Related Disorders (*POLG*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
96	Pompe Disease (*GAA*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
97	Prader-Willi Syndrome (*SNRPN*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
98	Early-onset Primary Dystonia (*TOR1A*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
99	Primary Dystonia (*THAP1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
100	Primary Hyperoxaluria Type 1 (*AGXT*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
101	Pseudorheumatoid Dysplasia (*WISP3*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
102	PTEN-related disorders (*PTEN*) - Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
103	PTEN-related disorders (PTEN)- Deletion/duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
104	Purine Nucleoside Phosphorylase Deficiency (*PNP*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
105	Pyruvate Dehydrogenase Deficiency (*PDHA1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
106	Retinoblastoma (*RB1*) - Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
107	Retinoblastoma (RB1)- Deletion/duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
108	Schinzel Giedion Syndrome (*SETBP1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
109	SCN1A-Related Seizure Disorders (*SCN1A*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
110	Severe Congenital Neutropenia (*ELANE*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
111	Short-chain acyl-CoA Dehydrogenase Deficiency (*ACADS*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
112	Short-Chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency (*HADH*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
113	Spinal Muscular Atrophy (SMA) - Sequencing	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
114	Spinal Muscular Atrophy (SMA) - Deletion/duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
115	Sulfite Oxidase Deficiency (*SUOX*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
116	Tyrosine Hydroxylase Deficiency (*TH*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
117	Very Long Chain Acyl-CoA Dehydrogenase (*ACADVL*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
118	Whole mitochondrial DNA (Full panel)	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal 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	1.3 months 2.3 months	Molecular Diagnostic IMR Jalan Pahang KL	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	Whole mitochondrial DNA (mtDNA hotspots)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
120	X-Chromosome Inactivation	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
121	X-linked Adrenoleukodystrophy (*ABCD1*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
122	Spinocerebellar Ataxia Full Panel (SCA1, SCA2, SCA3, SCA6 and SCA7)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
123	Spinocerebellar Ataxia Type 1 (SCA1)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
124	Spinocerebellar Ataxia Type 2 (SCA2)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
125	Spinocerebellar Ataxia Type 3 (SCA3)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
126	Spinocerebellar Ataxia Type 6 (SCA6)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
127	Spinocerebellar Ataxia Type 7 (SCA7)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
128	Mitochondrial Trifunctional Protein Deficiency-beta subunit *(HADHB)*	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
129	Kennedy Disease	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
130	Cystinuria *(SLC3A1)*	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
131	Mitochondrial DNA Depletion Syndromes (*TK2*)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
132	Short Syndrome *(PIK3R1)*	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
133	Testing of familial mutations/Carrier testing	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine)/muscle biopsy	1 month or 3 months (according to test)	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
134	Specific mutation screening (1 mutation)	Blood/ Urine sediment/muscle biopsy	EDTA tube Universal container	1-2 x 2.5ml blood EDTA or dried blood spot/urine sediment (20 mL of early morning urine)/muscle biopsy	1 month or 3 months (according to test)	Molecular Diagnostic IMR Jalan Pahang KL	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 send in ice.
135	FGFR2-related disorders (*FGFR2*) - FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
136	FGFR3-related disorders (*FGFR3*) FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
137	Cartilage Hair Hypoplasia (CHH)-FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	1 month	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
138	Friedreich Ataxia (FRDA)-FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
139	POLG-Related Disorders (*POLG*)-Deletion/Duplication	Blood	EDTA tube	1-2 x 2.5ml blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
140	Mitochondrial Deletion	Muscle biopsy/Urine sediment/Blood	EDTA tube Universal container	Muscle biopsy/ urine sediment (20 mL of early morning urine)/1-2 X 2.5mL blood EDTA	3 months	Molecular Diagnostic IMR Jalan Pahang KL	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 sendk in ice.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
141	MPS III B *(NAGLU)- FOR GOVERNMENT HOSPITALS ONLY*	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If >3 hours, keep sample cooled. Protect from freezing.
142	Barth Syndrome (TAZ) - FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect fro m freezing.
143	Prader-Willi Syndrome (uniparental disomy/imprinting defect) - FOR GOVERNMENT HOSPITALS ONLY (COMPULSORY TO SEND PROBAND AND BOTH BIOLOGICAL PARENTAL SAMPLES)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.

No	Test Name	Specimen type	Container	Volume	TAT	Location	Remarks/ Requirement
144	Angelman Syndrome (uniparental disomy/ imprinting defect) - FOR GOVERNMENT HOSPITALS ONLY (COMPULSORY TO SEND PROBAND AND BOTH BIOLOGICAL PARENTAL SAMPLES)	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.
145	Myotonic Dystrophy Type 1 (DM1) - FOR GOVERNMENT HOSPITALS ONLY	Blood	EDTA tube	1-2 x 2.5ml blood EDTA or dried blood spots	3 months (4 months if TP-PCR is carried out)	Molecular Diagnostic IMR Jalan Pahang KL	Send at ambient temperature. If more than 3 hours, keep sample cooled. Protect from freezing.

APPENDIX: REQUEST FORM FOR SPECIALIZED TESTS

(Forms displayed are the latest version available during publication of this laboratory manual. Please refer to the respective unit prior to sending sample for the latest version form available)

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 / in	Stillbirth	Neonatal death	Neonatal seizures	Metabolic disease
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
AST : _____ U/L
ALP : _____ U/L

Blood Glucose : _____ mmol/L
Blood Ammonia : _____ umol/L
Blood Lactate : _____ mmol/L
Pyruvate : _____ mmol/L

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

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

Anion Gap : _____

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

Provisional Diagnosis :

7. Test Required : (Please tick ONLY appropriate test / s required)

1		Inborn Error Metabolism (IEM) Screening, Blood Spot
2		Biotinidase Enzyme Activity, Blood Spot
3		Galactosemia Screening, Blood Spot
4		Acid Alpha-Glucosidase (POMPE), Blood Spot
5		Lysosomal Storage Disorders (LSD) Screening, Blood Spot
6		Amino Acids, Plasma
7		Amino Acids, CSF
8		Carnitine Total & Free, Plasma
9		Homocysteine Total, Plasma
10		Pipecolic Acid, Plasma
11		Peroxisomal Disorder Profile, Plasma / Serum *(VLC)*
12		Organic Acids, Urine
13		Orotic Acid, Urine
14		Succinylacetone, Urine
15		Myoglobin & Hemoglobin, Urine
16		Cystine & Homocystine, Urine
17		Argininosuccinic Acid, Urine *(ASA)*
18		Lysine Metabolism Profile, Urine *(P6C)*
19		Sugar & Polyols, Urine
20		Mucopolysaccharides (GAGs / HRE), Urine
21		Oligosaccharide, Urine
22		S-Sulphocysteine, Urine
23		Sialic Acid, Total & Free, Urine
24		Delta-Amino Levulinic Acids (Delta-ALA), Urine *(protect from light)*
25		Porphyria Profile, Urine *(protect from light)*
26		Creatine & Guanidinoacetic Acid, Urine
27		Creatine & Guanidinoacetic Acid, Blood Spot
28		Creatine & Guanidinoacetic Acid, Plasma
29		5-Hydroxy-Indole-Acetic Acid (5-HIAA) for Carcinoid Tumour, 24 H Urine
30		Biogenic Amines, CSF - Neurotransmitter *(protect from light)*
31		Biogenic Amines, Urine - Neurotransmitter *(protect from light)*
32		Pterins, Urine - Neurotransmitter *(protect from light)*
33		Pterins, CSF - Neurotransmitter *(protect from light, special microtube with preservative EDTA and DTE provided by the Biochemistry Unit, IMR)*

BY CONSULTATION ONLY
(Please state the person's name whom spoken to upon requesting the following test / s)

SPOKEN TO :

34		Amino Acids, Urine
35		Carnitine, 24 H Urine
36		Organic Acids, Plasma **(FORENSIC ONLY)**
37		Organic Acids, Vitreous Humour **(FORENSIC ONLY)**
38		PANEL TEST : Mucopolysaccharidoses Enzyme Assays *(Choose **NOT** more than **TWO** diseases of enzyme)*
		i. MPS Type I (IDA)
		ii. MPS Type II (IDS)
		iii. MPS Type IIIa (SULP)
		iv. MPS Type IIIb (AHEX)
		v. MPS Type IVa (GALSO)
		vi. MPS Type IVb (BGAL)
		vii. MPS Type VI (ASB)
		viii. MPS Type VII (BGLUCU)
		ix. Multiple Sulphatase (ASA)
39		PANEL TEST : Lysosomal Storage Disease Enzyme Assays *(Choose **NOT** more than **TWO** diseases of enzyme)*
		i. Aspartylglucosaminuria (GASP)
		ii. Sandhoff Disease (BHEX)
		iii. ß-Mannosidosis (BMAN)
		iv. Tay-Sachs Disease (MUGS)
		v. Fabry Disease (AGAL)
		vi. Mucolipidosis (AMANP)
		vii. Leukodystrophy (ASA)
		viii. GM1-Gangliosidosis (BGAL)
		ix. α-Mannosidosis (AMAN)
		x. Fucosidosis (AFUC)
		xi. Ceroid Lipofuscinosis (PPT)
		xii. Gaucher Disease (BGLU)
		xiii. Krabbe Disease (GALC)
		xiv. General LSD Marker (CHITO)
		xv. Schindler Disease (ANAG)
		xvi. Niemann Pick A/B (ASM)
40		Others (please specify) :

For details information of sample requirements, please refer to IMR Test List and IMR Handbook available at IMR Website (www.imr.gov.my)

Collected by :

Date specimen collected :

Date specimen sent :

Specialist In-Charge (Sign & Stamp) :

HTA/PAT/GEN/PK-01-03

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

UNTUK KEGUNAAN MAKMAL:

No Makmal:

BORANG PERMOHONAN UJIAN IEM / IEM REQUEST FORM

Nota:

1. ***Sampel air kencing:*** *2-5mL urin dalam botol urin steril tanpa pengawet. Untuk beberapa permohonan ujian urin, 5mL urin diperlukan di dalam satu botol urin steril. Ujian Urin Sulphite perlu dijalankan dalam masa 30 minit selepas pengumpulan urin. Jika waktu penghantaran 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

Simptom & Tanda-tanda Penyakit / Symptoms & signs of current illness

☐ Septicaemia-like illness	☐ Neurological	☐ Failure to thrive	☐ Dysmorphism
☐ Recurrent infection	☐ Seizures or h/o seizure	☐ Poor sucking feeding	☐ Macrocephaly
☐ Respiratory distress	☐ Hypotonia/floppiness	☐ Feeding intolerance	☐ Microcephaly
☐ Prolonged jaundice	☐ Mental retardation	☐ Recurrent vomiting	☐ Hepatomegaly
☐ Metabolic acidosis	☐ Developmental delay	☐ Hypoglycemia	☐ Splenomegaly
☐ Eczema/other rashes	☐ Coma	☐ Unusual odours	☐ Cardiomyopathy

Lain-lain/Others (*specify*): .....

Sejarah Keluarga / Family history

☐ Consanguinity ☐ Recurrent abortions/stillbirth ☐ Recurrent neonatal death ☐ 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:

ALT:
AST:
ALP:
Blood glucose:
Blood ammonia:
Blood lactate:
Blood pyruvate:
Ketones: Positive / Negative
Reducing sugar: Positive / Negative
Blood Gases:
- Normal
- Metabolic: Acidosis/Alkalosis
- Respiratory: Acidosis/Alkalosis

Anion Gap:
Other relevant test (*specify*):
.....

Permintaan Ujian / Test Request:

No.	Tests	Tick(√)
1.	Dried Blood Spot: Acylcarnitines & Amino Acids for IEM Screening (AA_AC) ☐ 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) ☐ With Succinylacetone *(tick if required)*	
10.	Urine Sulphite & Sulphocysteine (SULPH)	
11.	Urine Cystine: Qualitative (QLCYSTINS)	
12.	Urine Cystine & Homocystine: Quantitative (CYS_HOMO)	

DIAGNOSIS: .....

Tandatangan dan Cop Rasmi Pakar/Pakar Perunding:
Tarikh:
No Telefon:
Email:

No. Keluaran : 01
No. Pindaan : 01

Tarikh Kuatkuasa: 6 Disember 2022
Mukasurat 1 dari 1

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: ☐ Malay ☐ Chinese ☐ Indian ☐ Other (please specify) _____	
7. Gender: ☐ Male ☐ Female ☐ 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 ☐ No ☐	Please specify : ---------- ---------- -
3. Treatment given/ Drug therapy:		Please specify :
• Steroids:	Yes ☐ No ☐	---------- ---------- -
• Hormonal treatment:	Yes ☐ No ☐	---------- ----------
• Anti-reproductive therapy:	Yes ☐ No ☐	---------- ----------
• Oral hypoglycemic agents / Insulin:	Yes ☐ No ☐	---------- ----------
• Other drugs :(Please state)	Yes ☐ No ☐	---------- ----------

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:_____	

Provocative tests (Please include full results and interpretation)	
Synacthen test:	
β HcG Stimulation test:	
Other tests:	
Ultrasound / CT scan /MRI findings:	
Other relevant tests (specify) :	

D. Provisional Diagnosis :

E. Test requested : (Please tick ONLY appropriate test/s required)

☐ 17-Hydroxyprogesterone (random)

☐ 17-Hydroxyprogesterone (0, 30, 60 min)
For Synacthen: please include 0, 30, 60 min samples in a single request form

☐ Anti-Müllerian Hormone (AMH)

Diabetes Antibodies Panel : Please send in a single request form & single tube

☐ Anti-Islet Cells (ICA) , Anti-Glutamic Acid Decarboxylase (GAD 65) , Anti-Insulinoma-Associated Antigen 2 (IA2)	☐ Anti-Glutamic Acid Decarboxylase (GAD 65) (For neurological disorders)

Other relevant tests (specify) : _____

IMPORTANT NOTICE:

To ensure correct and reliable result given, the following must be followed strictly :

1. Please fill up the entire form with clinician requestor signature.
2. Separate plasma/ serum from RBC immediately.
3. Grossly hemolysed samples will be rejected. Please send only separated serum/ plasma (not the whole blood/ separated sample in gel tube).
4. At least 1.0 – 2.5 ml of serum/ plasma in plain tube is required for each test (Please send one tube with sufficient volume if request for multiple tests).
5. All samples must be kept and transported in suitable temperature, 2-8 ^{0}C to IMR.

***** For detailed information of sample requirement, please refer to IMR test list available at IMR website (www.imr.gov.my).

Collected by:

Date of specimen collection:

Date of specimen sent:

Requested by:

Specialist in charge Signature & stamp:

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

To The Requesting Lab / Person,
Please STAMP HERE

Patient Name :	
Patient IC/ID :	**Hospital :**
Date of Birth : **Age :**	**Ward/Clinic :**
Gender : Male / Female / Unknown	**Name of Attending Doctor (Specialist) :**
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	:	❒ Affected patient	❒ Possibly affected patient
Carrier testing	:	❒ Father of affected patient	❒ Mother of affected patient
		❒ Sibling of affected patient	❒ Other family member of affected patient (please specify) : ……
Predictive testing	:	❒	

Type of Specimen Sent:
❒ Whole blood ❒ Blood spot ❒ Tissue (please specify) : …… ❒ Urine ❒ Extracted DNA

❒ Others (please specify): …… Date of sample taken: ……

Please Read This Section Before You Proceed

Requirements for clients requesting molecular diagnostics services from UMD, IMR :

1. ***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.***
2. *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.*
3. *Please send the samples according to the criteria for sample collection as outlined below.*
4. *Kindly ensure samples are sent together with both the request form and informed consent form.*

Criteria for sample collection :

1. *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.*
2. *10 – 20 ml urine in appropriate container. Urine must be refrigerated after collection.*
3. *Tissue samples must be placed inside sterile container. Please contact us for a detailed guideline on tissue sample collection, preservation and storage.*
4. *DNA, urine and tissue samples must always be kept chilled until the samples arrive at the laboratory.*

Clinical Signs and Symptoms, Age of Onset, Relevant Laboratory (eg.: biochemical testing result) and Imaging Findings :

Clinical Diagnosis : ……
Parental Consanguinity : ❒ Yes ❒ No

Pedigree (Family Tree)
(Can also be attached on a separate sheet) :

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 :

LIST OF DISORDERS/GENES TESTED IN UNIT OF MOLECULAR DIAGNOSTICS (UMD), IMR

- Please mark √ to select
- Please note that genetic testing **will only be accepted upon consultation with Clinical Geneticist/Neurologist** and/or if **biochemical testing result** or any relevant screening test result is **suggestive** of the respective disease

INHERITED METABOLIC DISORDERS (IEM)

(A) Disorders of Amino Acids & Organic Acids Metabolism

1	Argininosuccinate Lyase Deficiency *(ASL Sequence Analysis)*		10	Glutaric Aciduria Type 1 *(GCDH Sequence Analysis)*		19	Methylmalonyl-CoA Epimerase Deficiency *(MCEE Sequence Analysis)*	
2	Argininosuccinate Synthase Deficiency *(ASS1 Sequence Analysis)*		11	Hypophosphatasia *(ALPL Sequence Analysis)*		20	N-Acetylglutamate Synthase (NAGS) Deficiency *(NAGS Sequence Analysis)*	
3	Aromatic Amino Acid Decarboxylase Deficiency *(DDC Sequence Analysis)*		12	Lysinuric Protein Intolerance (LPI) *(SLC7A7 Sequence Analysis)*		21	Non Ketotic Hyperglycinemia (NKH) - Panel *(AMT /GLDC /GCSH Sequence Analysis / GLDC Deletion/Duplication Analysis)*	
4	Biotinidase Deficiency *(BTD Sequence Analysis)*		13	Maple Syrup Urine Disease (MSUD) *(DLD Sequence Analysis)*		22	Ornithine Transcarbamylase (OTC) Deficiency *(OTC Sequence Analysis)*	
5	Carbamoyl Phosphate Synthetase 1 (CPS1) Deficiency *(CPS1 Sequence Analysis)*		14	Maple Syrup Urine Disease (MSUD) - Panel *(BCKDHA /BCKDHB /DBT Sequence Analysis)*		23	Primary Hyperoxaluria Type 1 *(AGXT Sequence Analysis)*	
6	Citrin Deficiency (Type II Citrullinemia) *(SLC25A13 Sequence Analysis)*		15	Methylenetetrahydrofolate Reductase Deficiency *(MTHFR Sequence Analysis)*		24	Pyruvate Dehydrogenase Deficiency *(PDHA1 Sequence Analysis)*	
7	Classical Homocystinuria *(CBS Sequence Analysis)*		16	Methylmalonic Acidemia (MMA) - Panel *(MMUT /MMAA /MMAB Sequence Analysis)*		25	Tyrosine Hydroxylase Deficiency *(TH Sequence Analysis)*	
8	Cystinuria *(SLC3A1 Sequence Analysis)*		17	Methylmalonic Aciduria and Homocystinuria Type C *(MMACHC Sequence Analysis)*				
9	Ethylmalonic Encephalopathy *(ETHE1 Sequence Analysis)*		18	Methylmalonic Aciduria and Homocystinuria Type D *(MMADHC Sequence Analysis)*				

(B) Fatty Acids Oxidation Defects

26	Carnitine Palmitoyltransferase 1 (CPT1) Deficiency (*CPT1A Sequence Analysis*)	
27	Carnitine Palmitoyltransferase 2 (CPT2) Deficiency (*CPT2 Sequence Analysis*)	
28	Carnitine Uptake Deficiency *(OCTN2 Sequence Analysis)*	
29	Carnitine-Acylcarnitine Translocase Deficiency *(SLC25A20 Sequence Analysis)*	
30	Long-Chain 3-Hydroxyacyl-CoA Dehydrogenase (LCHAD) Deficiency (*HADHA Sequence Analysis*)	
31	Medium Chain Acyl-CoA Dehydrogenase (MCAD) Deficiency (*ACADM Sequence Analysis*)	
32	Mitochondrial Trifunctional Protein Deficiency *(HADHB Sequence Analysis)*	
33	Short Chain Acyl-CoA Dehydrogenase (SCAD) Deficiency *(ACADS Sequence Analysis)*	
34	Short-Chain 3-Hydroxyacyl-CoA Dehydrogenase (SCHAD) Deficiency *(HADH Sequence Analysis)*	
35	Very Long Chain Acyl-CoA Dehydrogenase (VLCAD) Deficiency *(ACADVL Sequence Analysis)*	

(C) Disorders of Carbohydrate Metabolism

36	Classical Galactosemia *(GALT Sequence Analysis)*	
37	Fructose-1,6-Bisphosphatase Deficiency *(FBP1 Sequence Analysis)*	
38	Galactokinase Deficiency *(GALK1 Sequence Analysis)*	
39	Galactose Epimerase Deficiency *(GALE Sequence Analysis)*	
40	Glycogen Storage Disease Type Ia *(G6PC Sequence Analysis)*	
41	Glycogen Storage Disease Type Ib *(SLC37A4 Sequence Analysis)*	
42	Glycogen Storage Disease Type III *(AGL Sequence Analysis)*	
43	Phosphomannomutase 2 Deficiency (PMM2-CDG) *(PMM2 Sequence Analysis)*	

(D) Lysosomal Storage Diseases

44	Gaucher Disease *(GBA Sequence Analysis)*	
45	Pompe Disease (GSD II) *(GAA Sequence Analysis)*	
46	Maroteaux-Lamy Syndrome (MPS VI) *(ARSB Sequence Analysis)*	
47	Morquio A Disease (MPS IVA) *(GALNS Sequence Analysis)*	
48	Metachromatic Leukodystrophy (MLD) *(ARSA Sequence Analysis)*	
49	Fucosidosis *(FUCA1 Sequence Analysis)*	

(E) Disorders of Purine & Pyrimidine Metabolism

50	Dihydropyrimidinase (DHP) Deficiency *(DPYS Sequence Analysis)*	
51	Hereditary Orotic Aciduria *(UMPS Sequence Analysis)*	
52	Purine Nucleoside Phosphorylase Deficiency *(PNP Sequence Analysis)*	
53	Lesch-Nyhan Syndrome *(HPRT1 Sequence Analysis)*	

(F) Other Metabolic Disorders

54	Alpha 1-Antitrypsin Deficiency *(SERPINA1 Sequence Analysis)*	
55	Acute Intermittent Porphyria - Panel *(HMBS Sequence Analysis / Deletion/Duplication Analysis)*	
56	Canavan Disease *(ASPA Sequence Analysis)*	
57	Sulfite Oxidase (SUOX) Deficiency *(SUOX Sequence Analysis)*	
58	X-linked Adrenoleukodystrophy *(ABCD1 Sequence Analysis)*	

IMR/SDC/UMD/CONSENT FORM

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

CONSENT FOR MOLECULAR DIAGNOSTICS SERVICES

Patient Name: _____ Patient ID:_____

The samples that I provide together with the request form are to be used for molecular genetic testing of:

_____
(Specify the disorder or disease to be tested)

The molecular genetic testing may provide a diagnosis of or indication of risk for me or my offspring for the disorder or disease specified above.

I understand the molecular genetic testing may not yield results for any combination of the following reasons: 1) unavailable blood or tissue samples from critical family members; 2) uninformativeness of the available genetic markers; 3) maternal contamination of prenatal samples; 4) technical reasons.

I understand that DNA analysis may yield information on biological paternity, the results of which will not be disclosed to me unless biological paternity is relevant in counseling for the reason for which I have submitted this DNA sample. I agree to provide a family history to the best of my knowledge.

I **AGREE/DO NOT AGREE** to have my samples or DNA extracted from my samples be used for the purpose of research and development or as quality control in diagnostics laboratory.

Additional samples may need to be collected from me in the absence of results, or if the results are inconclusive.

The DNA extracted from my (my child's) samples will be stored in the DNA bank at the Institute for Medical Research or its responsible delegate.

I understand that any information identifying me (my child) will be kept confidential and that any exchange of samples or information will be coded.

No compensation will be given to me (my child) nor will funds be forthcoming to me (my child) due to invention resulting from research and development using my (my child's) DNA.

Your signature on this form indicates that you have understood to your satisfaction the information regarding molecular genetic testing and agree to participate. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. If you have further questions concerning matters related to this consent, please discuss them with your medical geneticist, genetic counselor, or referring physician.

_____
(Signature of patient or legal guardian and date)

_____
(Signature of witness and date)

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

To The Requesting Lab / Person, Please STAMP HERE

Patient name :		**Hospital :**	**Ward :**
IC number :		**Registration No. (RN) :**	
Age :	**Gender :** ☐ **Male** ☐ **Female**	**Hospital contact:-** **Tel. no :** **Fax no :** **Email :**	
Ethnic:	**Nationality:**		

Clinical Diagnosis:

A) Multiple Myeloma
New case ☐
Follow up case ☐

B) Other than Multiple Myeloma *(please specify)*:
.....

Clinical Symptoms & Signs:

- ☐ Anaemic
- ☐ Bone fracture
- ☐ Bone pain
- ☐ Constitutional symptoms
- ☐ Hepato/Splenomegaly
- ☐ Infections
- ☐ Lymphadenopathy
- ☐ Muscle weakness
- ☐ Nephrotic syndrome
- ☐ Peripheral neuropathy
- ☐ Prolonged Jaundice
- ☐ Respiratory symptoms
- ☐ Vision problem
- ☐ No symptom related to M protein
- ☐ Others *(please specify)*:
  .....
  .....

Laboratory findings *(for Mutiple 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:

Test requested :

A. Multiple Myeloma :-

- i) Protein Electrophoresis, Serum ☐
- ii) Protein Electrophoresis, Serum and Urine ☐
- iii) Free Light Chain Quantitation, Serum ☐

B. Specific Protein Quantitation :-

- i) Transferrin, Serum ☐
- ii) Alpha 1 Antitrypsin, Serum ☐
- iii) Beta 2 Microglobulin, Serum ☐

C. Protein Profilling :-

- i) Transferrin Isoform, Serum ☐
- ii) Alpha 1 Antitrypsin Phenotyping, Serum ☐
- iii) Oligoclonal Band, CSF and Serum ☐

Types of specimen:	☐ Serum ☐ Urine ☐ CSF
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, turbic 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.

AUTOIMMUNE REQUEST FORM

Autoimmune Unit, Allergy & Immunology Research Centre (AIRC)
Institute For Medical Research (IMR)
National Institute of Health (NIH)
Seksyen U13 Setia Alam, 40170 Shah Alam, Selangor
Contact No : 03 3362 8381
Email : autoimununit@moh.gov.my

	Free
	Paid

Resit No.:

1. Name:	2. R/N :
3. I/C No.:	4. Ward/Clinic:
5. Age: Race:	6. Hospital:
7. Gender: ☐ Male ☐ Female	8. Specimen type: ☐ Serum ☐ CSF
9. A) Clinical history:	B) Diagnosis:

10. Test Required : (Please tick **ONLY ONE** appropriate test / required)

No	Test Name	Please Tick
1.	Anti-Acetylcholine Receptor Antibody (**ACHR**)	
2.	Anti-Aquaporin 4 (**AQ4**)	
3.	Anti-Glomerular Basement Membrane (**GBM**)	
4.	**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)	
5.	Anti-N-Methyl-D-Aspartate Receptor (**NMDAR**)	
6.	**Coeliac Antibodies** Panel Anti-Endomysium, Anti Gliadin, Anti Tissue Transglutaminase	
7.	**Cytokine Test** Panel: IL-1b, IL-6, IL-8 & TNF-a *(By appointment only)*	

No	Test Name	Please Tick
8.	Phospholipase A_2 Receptor antibody (**PLA2R**)	
9.	**Paraneoplastic Neurological Syndrome** (**PNS**) Panel: Anti-Tr (DNER), Anti-GAD65, Anti-Zic4, Anti-TItin, Anti-SOX1, Anti-Recoverin, Anti-Amphiphysin, Anti-Ma2/Ta, Anti-Yo, Anti-Ri, Anti-Hu, Anti-CV2	
10.	**Skin Antibodies** Panel Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3	
11.	**Specific Liver Antibodies** (**SLA**) Panel Anti-AMA-M2, M2 3E/BPO, Sp100, PML, gp210, LKM1, LC-1, SLA/LP, Ro-52. **COMPULSORY** to specify the tissue antibody results (please tick in the box below):	

Test	Detected	Not Detected
AMA		
ASMA		
LKM		

IMPORTANT NOTICE : To ensure correct and reliable result given, please fill up the entire form and following must be followed:

1. ***3.5 ml blood in plain tube or gel tube is required for each test (Please send one tube and request form per test).***
2. ***Separate plasma/serum from RBC immediately. Grossly hemolysed samples will be rejected.***
3. ***All samples (serum/ CSF) must be kept and transport in cool temperature, 2-8 ºC (transport in ICE to IMR).***
4. ***Please enclose the screening test results along with this form for test No. 11 (SLA).***

11. Specimen Collected Date Date: ☐☐☐☐☐☐ Time: ☐☐☐☐

12. Applicant's name:……..

13. Date: …… ……

Signature & Stamp

UPD-1/PINDAAN 2020
No. Rujukan Makmal:

BORANG PERMINTAAN UJIAN PENGESANAN DADAH DALAM AIR KENCING

Bahagian 1 : Butiran Pemberi Sampel

a. Nama (HURUF BESAR) :

b. No KP/Pasport: c. Tarikh Lahir: _____

d. Alamat : _____

e. Bangsa : _____ f. Warganegara : _____ g. Jantina : Lelaki /Perempuan

Bahagian 2 : Butiran Ujian

Jenis Ujian Yang Dipohon:

a. Opiate / Morphine ☐ Cannabinoids / THC ☐ c. ATS (Amp/Meth/MDA/MDMA) ☐
d. Ketamine ☐ Lain-lain. (*Sila Nyatakan*) : _____

Bahagian 3 : Butiran Agensi/Jabatan Yang Merujuk

a. Polis ☐ b. Tentera ☐ c. AADK ☐ d. Lain-lain _____
(Sila Nyatakan)

e. No. Report/Kes: _____ f. Seksyen: _____

g. No. Siri Botol/Label : _____ h. No. Siri Tag Beg: _____

i. No. Meterai: _____ j. Tarikh&Masa Spesimen Dipungut: _____

k. Pegawai Pemungut: _____ l. No. KP: _____

m. Pegawai Membuat Permintaan: _____ n. No. KP: _____

_____ _____
(Tandatangan Pegawai Membuat Permintaan & Cop Jawatan / Jabatan) *(Tarikh)*

Bahagian 4 : Akuan Pemberi

Saya yang bernama _____

dan No. KP/Pasport _____ dengan ini mengesahkan telah menyerahkan spesimen air kencing saya kepada pegawai pemungut untuk dijalankan ujian pengesanan dadah dalam air kencing.

Tandatangan : _____ Tarikh : _____

Bahagian 5 : Pengesahan Penerimaan Spesimen

a. Nama Pembawa Spesimen (HURUF BESAR) :

b. No KP:

_____ _____
(Tandatangan Pembawa Spesimen) *(Tarikh & Masa)*

_____ _____
(Tandatangan, Nama& Cop Penerima Spesimen) *(Tarikh & Masa)*

Bahagian 6 : Catatan (Untuk Kegunaan Makmal Sahaja)

(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:

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).

Cop Meterai/Seal Keselamatan

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.

(Kimia 15-Pin. 2/2016)

Bahagian 2:

a) Butiran Spesimen

Spesimen	Tandaan	Masa dan Tarikh diambil	Analisis diperlukan
Darah			☐ Alkohol
Air Kencing			☐ Racun makhluk perosak
Kandungan Perut			☐ Dadah
Cucian Perut/ Muntah			☐ Bahan Kakisan / Asid
Hempedu (bile)			☐ Gas karbon monoksida
Lain-lain (sila nyatakan) :			☐ Logam
			☐ Bahan Pelarut
			☐ Lain-lain (nyatakan)

		Ya	Tidak
Bahan Pengawet Sodium Fluoride digunakan:	Darah	☐	☐
	Air Kencing	☐	☐
Anticoagulant: (Hanya dalam darah)	Sodium Oxalate	☐	☐
	Sodium Citrate	☐	☐
	Lain-lain(sila nyatakan) _____		

b) Simptom _____

c) Hal-hal berkaitan (yang difikirkan perlu dinyatakan seperti jenis racun disyaki)

_____

Tandatangan: _____ Tarikh: _____

Nama Pegawai Perubatan: _____

Jawatan: _____

Hospital _____

Telefon: _____

(Kimia 15-Pin. 2/2016)

GARIS PANDUAN

(Sila hubungi Jabatan Kimia Malaysia yang berhampiran bagi mendapatkan khidmat nasihat atau layari laman web di www.kimia.gov.my)

SPESIMEN UNTUK ANALISIS BAGI KES TOKSIKOLOGI

1. SPESIMEN YANG SESUAI

Spesimen	Kuantiti
Darah	10 mL (ante-mortem) 25 ml (peripheral-post mortem)
Air Kencing	25 ml
Vitreous Humor	semua
Cucian Perut/Muntah	semua
Kandungan Perut	semua
Hempedu (jika perlu)	semua
Otak (jika perlu)	100 gm
Hati (jika perlu)	100 gm
Buah pinggang (jika perlu)	50 gm

i) Dalam kes post-mortem di mana mayat dalam keadaan 'putrefied' adalah dinasihatkan mengambil darah, air kencing dan vitreous humour untuk analisis alkohol.
ii) Spesimen darah sepatutnya diambil dari "cubital fossa, femoral or other peripheral vein". Dalam kes post-mortem pengambilan spesimen darah dari jantung, 'abdominal or thoracic cavities' tidak digalakkan.

2. BEKAS UNTUK SPESIMEN DAN BAHAN PENGAWET

i) Spesimen darah dan air kencing hendaklah diisi ke dalam tiub/botol/bekas plastik yang mengandungi sodium fluoride (bahan pengawet) dalam kepekatan sekurang-kurangnya 1-2%.
ii) Spesimen darah (ante-mortem), mesti mengandungi anticoagulant sodium oxalate/citrate dalam kepekatan 0.5% bagi menghalang proses pembekuan (clotting).
iii) Spesimen organ dan tisu hendaklah diisi ke dalam botol/bekas kaca yang sesuai
iv) Jangan gunakan Formalin sebagai bahan pengawet untuk specimen organ dan tisu. Sila gunakan Saturated Saline.
v) Pastikan bekas untuk specimen tiada kebocoran.

3. PERLABELAN

Bekas spesimen sekurang-kurangnya mempunyai keterangan/label seperti berikut:

i) Nama:
ii) Spesimen:
iii) No.Pendaftaran Hospital
iv) Masa dan tarikh diambil
v) No.Repot Polis (jika berkaitan)
vi) Bahan Pengawet: Ada/Tiada

4. METERAI

Bekas mesti dimeterai dengan terang.

5. ANTISEPTIK

Alkohol tidak boleh digunakan untuk tujuan pencucian kulit pesakit semasa spesimen darah diambil. Gunakan antiseptik yang sesuai.

6. PENGHANTARAN

i) Semua spesimen untuk analisis mesti diserahkan bersama Borang Kimia 15 yang telah diisikan oleh Pegawai Perubatan.
ii) Borang mesti disimpan berasingan dari spesimen.
iii) Jika kes polis, spesimen dan borang Kimia 15 mesti diserahkan oleh pihak polis bersama borang Polis 31.
iv) Spesimen mesti diserahkan untuk analisis dengan segera.
v) Sekiranya berlaku kelewatan spesimen mesti disimpan dalam peti sejuk.

SPESIMEN BAGI UJIAN DNA

i) Spesimen darah cecair hendaklah dipungut dalam tiub/botol yang mengandungi EDTA. Jangan tambah bahan pengawet seperti Sodium Fluoride.
ii) Sekiranya terdapat kad FTA, kad tersebut harus digunakan untuk pungutan darah. Darah pada kad FTA hendaklah dibiarkan kering pada suhu bilik dan dilabelkan dengan lengkap seperti yang diterangkan diperenggan 3.
iii) Tisu, tulang, rambut dan kuku hendaklah diletakkan di dalam bekas kering yang telah di seterilkan tanpa diisi sebarang pengawet seperti Formalin.
iv) Swab dari bahagian "Vaginal, Anal and Rectal" hendaklah menggunakan putik kapas yang di seteril dan diletakkan di dalam tiub tanpa sebarang reagen atau additif

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.:		☐ Bujang ☐ Berkahwin ☐ Lain-lain

B. TUJUAN PERSAMPELAN Tanda (√) yang berkenaan				**C. LAIN-LAIN MAKLUMAT**	
Wabak/ Kluster	☐	Pesakit (Ada gejala)	☐	**Lokaliti kejadian:**	
Survelan	☐	Kes	☐		
Diagnostik	☐	Kontak	☐		
Projek	☐	Kluster	☐	Sejarah melancong: Ada / Tiada	Negara:
Lain-lain	☐			Tarikh keluar:	Tarikh masuk:

D. RINGKASAN KLINIKAL	**Tanda (√) yang berkenaan**					
	Tanda dan Gejala	**Ada (√)**	**Tarikh *onset***	**Tanda dan Gejala**	**Ada (√)**	**Tarikh *onset***
	1) Demam (^{0}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: ^{0}C	Jenis sampel:	Terima / Tolak	
Sampel: Terima / Tolak	Sampel dlm transport media: Ya / Tidak	Suhu: ^{0}C	
Nama Penerima :	Nama Penerima:		
Tarikh & masa:	Tarikh & Masa:		
Keputusan ujian disahkan oleh :		Tarikh:	

TDM form

CLINICAL PHARMACOKINETICS SERVICE
Therapeutic Drug Monitoring (TDM) Request Form

Pharmacy Ref No:	
PhIS Report No:	

Note :
- *3 – 5 ml of blood sample is needed for analysis of 1 – 3 drugs.*
- *Use plain tubes for all the drugs except for Cyclosporin/Tacrolimus/Sirolimus/Everolimus (EDTA tube).*
- *Correct information is crucial as interpretation of results is dependent on the information provided.*

Date Received :
Time Received :

PATIENT PROFILE

Name :	Ward/Unit :			RN :	
Age :	Gender : M / F	Race: M / C / I / O		IC :	
Weight (kg) :	Height (cm) :			DOA :	

CLINICAL SUMMARY AND DIAGNOSIS

PATIENT CONDITION

❑ Oedema ❑ Liver Disease ❑ Dehydration
❑ Dialysis ❑ Burn ❑ Fit Frequency: .....

INDICATION FOR REQUEST

❑ Therapeutic Monitoring ❑ Non-compliance
❑ Suspected Toxicity ❑ Others .....

LATEST LAB RESULTS

Parameters	Date	Results (unit)	Parameters	Date	Results (unit)
Blood Urea			Temperature		
Na^+ / K^+			WBC		
Creatinine			ALT / AST / ALP		
Albumin			HR		
Culture & Sensitivity					

CONCURRENT MEDICATIONS

Drug Analysis (Tick ✔ where appropriate)	Present Dose Regimen	Dose Started		Dose Given		Pre-dose / Post 2 / C_0		Post-dose / Post 6 / C_2		Random	
		Date	Time	Date	Time	Date	Time	Date	Time	Date	Time
Acetaminophen											
Amikacin											
Carbamazepine											
Cyclosporin											
Digoxin											
Everolimus											
Gentamicin											
Lithium											
Methotrexate											
Phenobarbitone											
Phenytoin											
Salicylate											
Sirolimus											
Tacrolimus											
Theophylline											
Valproic acid											
Vancomycin											
Others (please specify)											

REFER TO TDM SERUM SAMPLING GUIDELINES (refer back page)

For injectable drug being analysed :
Infusion rate : .....
Duration of Infusion : .....

REQUESTED BY:

Doctor's Signature : _____ Name & Stamp : _____ Date : _____

FOR PHARMACY USE ONLY

Drug analysis	Result	Therapeutic Range	Calculated Pharmacokinetic Parameters			Time Finished:
			K_e : hr^{-1}	$t_{1/2}$: hr	Vd: L/kg	
			C_{min} : µg/ml	C_{max} : µg/ml		
			AUC_{24} : µg.hr/ml			Test done by:
			C_{ss} :	$C_{adjusted}$:	CrCl:	

Pharmacist's Assessment & Recommendation :

Informed : DR / SN / PF ..... on ..... at ..... am/pm

Pharmacist's signature & stamp

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 □Diagnostic Test □Carrier Screening:	□DNA Extraction & Storage □Others:	
JENIS SPESIMEN/ SPECIMEN TYPE □Whole Blood □Saliva	□Tissue: Block/Slides No: ..... □Others:	
RINGKASAN KLINIKAL CLINICAL HISTORY	**Current treatment:** □TKI: ..... □ 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	□New Diagnosis □Remission □Relapse □Others :	
KEPUTUSAN MAKMAL LAB INVESTIGATIONS	Previous genetic tests/HPE :	

PENYAKIT KONGENITAL CONGENITAL DISORDERS	**GENETIK KANSER/** CANCER GENETICS
□ Duchenne Muscular Dystrophy □ Becker Muscular Dystrophy □ Rett Syndrome □ Beckwith-Wiedemann Syndrome □ Russell-Silver Syndrome □ Y-Microdeletion □ CGH Microarray □ Others:	□ *EGFR* mutation testing □ *KRAS* mutation testing □ Microsatellite Instability (MSI) Testing □ Lung Cancer Gene Panel □ Breast/Ovarian Cancer Gene Panel □ Colorectal/Gastric Cancer Gene Panel □ Others: .....

Tandatangan dan Cop Rasmi Pakar/Pakar Perunding:
Tarikh:
No. Telefon & Emel:

HTA/PAT/GEN/PK-01-01

MAKMAL GENETIK
JABATAN PATOLOGI
HOSPITAL TUNKU AZIZAH
Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.
Telefon: 03-2600 3000 Sambungan: 1136 (Sitogenetik)
Email: sitogenetik.hta@moh.gov.my

UNTUK KEGUNAAN MAKMAL:

No Genetik:

BORANG PERMOHONAN UJIAN SITOGENETIK / CYTOGENETICS REQUEST FORM

Nota:

1. *Semua permintaan ujian genetik mesti melalui proses temujanji kecuali bagi kes-kes segera.*
2. *Analisis Kromosom:*
   - *Untuk sampel darah periferi, 3-5mL darah dalam tiub Lithium Heparin (tanpa gel).*
   - *Untuk sampel sumsum tulang, 3-5mL pensampelan aspirat pertama sumsum tulang dalam tiub Sodium Heparin*
   - *Pastikan jenis spesimen pada borang permohonan adalah berpadanan dengan tiub spesimen.*
3. *Sila pastikan sampel tiba di Makmal Genetik HTA sebelum tempoh 48 jam dari waktu pengambilan sampel untuk mengelakkan hemolisis. Sekiranya penghantaran sampel mengambil masa melebihi 24 jam, pastikan sampel disimpan terlebih dahulu dalam suhu 2-8°C dan kemudian dihantar bersama pek ais.*

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	**NOMBOR GENETIK TERDAHULU** PREVIOUS GENETIC NO	
NAMA BAPA: FATHER'S NAME: **NO KP/ID ALTERNATIF BAPA:** FATHER'S NRIC/ ALTERNATIVE ID:	**NAMA IBU:** MOTHER'S NAME: **NO KP/ID ALTERNATIF IBU:** MOTHER'S NRIC/ ALTERNATIVE ID:	

SPESIMEN SPECIMEN	**Tarikh Pengambilan**/Collection Date:..... *Sila tandakan satu sahaja (√):* □ **Darah Periferi**/Peripheral Blood □ **Sumsum tulang**/Bone Marrow □ **Darah tali pusat**/Fetal Cord Blood □ Others :.....
DIAGNOSIS	
RINGKASAN KLINIKAL CLINICAL HISTORY	
SALASILAH KELUARGA FAMILY PEDIGREE	Utamakan sejarah keluarga/perkahwinan keluarga terdekat/penyakit genetik/keguguran /kematian bayi). **SALASILAH WAJIB DIKEPILKAN DI HELAIAN LAIN.** Emphasize on any history of consanguinity/genetic disorders/affected family members/abortions/early neonatal deaths). PEDIGREE IS COMPULSORY TO BE ATTACHED IN A SEPARATE DOCUMENT.
STATUS PENYAKIT DISEASE STATUS	□New Diagnosis □Remission □Relapse □Post Stem Cell Transplant (Donor: F/M) □Family Screening □Others : .....
KEPUTUSAN MAKMAL LAB INVESTIGATIONS	*(For hemato-oncology cases – please attach BMA&T/Immunophenotyping/Molecular results).*

TEST REQUEST		
Conventional cytogenetics □ Constitutional Cytogenetics □ Hemato-Oncology Cytogenetics	**Molecular Cytogenetics (FISH)** □ Constitutional FISH* ..... □ Hemato-Oncology FISH* ..... □ Solid tumour FISH: ALK/ROS1	***Reflex FISH testing** Is performed based on underlying condition/ findings of conventional cytogenetics and/or prior FISH results.

Tandatangan dan Cop Rasmi Pakar/Pakar Perunding:
Tarikh:
No Telefon:
Emel:

No. Keluaran : 01
No. Pindaan : 01

Tarikh Kuatkuasa: 6 Disember 2022
Mukasurat 1 dari 1

DNA ANALYSIS FOR THALASSAEMIA SYNDROMES & HAEMOGLOBINOPATHIES

For IMR/ HKL/ HSB used only
Type of specimen ☐blood ☐DNA ☐others

Please ☑ below, WHERE you wish to send the sample and TEST request:

☐ DNA analysis of the beta globin gene ☐ Further testing for alpha/beta globin genes* ☐ Confirmation for haemoglobinopathy *Note: Only after common alpha/ beta globin gene mutations have been excluded by HKL/ HSB	☐ DNA analysis of the alpha globin gene ☐ DNA analysis of the beta globin gene ☐ Confirmation for haemoglobinopathy (HbE, HbS and HbC only)	☐ DNA analysis of the alpha globin gene
Molecular Genetics Laboratory ☐ **Haematology Unit, Cancer Research Centre** **Institute for Medical Research** **National Institutes of Health** Jalan Setia Murni U13/52, 40170, Shah Alam, Selangor, Malaysia. Phone: 03-3362 8644 Email: mgm.imr@gmail.com Website: www.imr.gov.my	**Molecular Hematology Laboratory** ☐ **Haematology Unit, Pathology Department** **Hospital Kuala Lumpur** 50586 Kuala Lumpur, Malaysia. Phone: 03-2615 5748/ 5746 Email: hematologihkl@moh.gov.com Website: www.hkl.gov.my	**Haematology Unit** ☐ **Pathology Department** **Hospital Sultanah Bahiyah** Km6, Jln Langgar, Bandar Alor Setar, 05460 Alor Setar, Kedah, Malaysia. Phone: 04-740 6250/ 6251 Fax: 04-740 6275

Patient Name:	**Date of Birth:** **Age:**	**Ethnicity:** ☐ **Malay** ☐ **Chinese** ☐ **Indian** ☐ **Others;**(specify) _____
Patient ID/IC Number:	**Gender:** ☐ **Male** ☐ **Female** **If female; Pregnant?** ☐ **YES, Weeks: ……** ☐ **No**	**Hosp/ Ward/ Clinic:**
Address of KK or hospital to send report: **Tel Number:**	**Type of Specimen:**	**Date of Sampling:** **Date Sent:**

CLINICAL SUMMARY/ FAMILY HISTORY/ FAMILY TREE.

Parental consanguinity: ☐ **YES** ☐ **NO**

THIS PART EXPLAINS SPECIMEN & TEST REQUIREMENTS/ CHECKLIST:

SPECIMEN REQUIREMENTS:
Peripheral blood in EDTA tube (must arrive at lab within 2 weeks)
☐ Adults: ~2.5 mL ☐Paeds: ~0.5mL

TEST REQUIREMENTS:
☐ A copy of recent FBC (<3 months) result of this patient
☐ A copy of Hb Analysis result of this patient
☐ All paediatrics (≤ 12 y.o.) sample to be referred to IMR, MUST be accompanied by both parents' FBC and Hb analysis results.

ADDITIONAL REQUIREMENTS FOR CASCADE SCREENING: ☐ Index case
i) Name: _____
ii) IC/Lab No: _____
iii) Diagnosis: _____
iv) Relationship to index case: _____
☐ A copy of DNA analysis for thalassaemia syndromes/ haemoglobinopathy result of INDEX case
☐ If Hb analysis report of this patient is pending:
i) Hospital performing the test: _____
ii) Date of sample sent: _____

This information is crucial for baseline correlation of molecular results. Please ☑ all that applies

INDICATION OF TEST:
☐ Diagnostic: ☐ Antenatal ☐ Others _____
☐ Screening: ☐ Form Four ☐ Cascade screening
☐ Others (specify): _____

CLINICAL DIAGNOSIS:

CLINICAL STATUS:
☐ **New Case**
- ☐ Trait
- ☐ Intermedia
- ☐ Major

☐ **Follow Up**
- ☐ TDT (≥6 transfusions/ year)
- ☐ NTDT

Hb level at diagnosis : _____ g/dL
Age at diagnosis : _____
Hepatomegaly : ☐ **NO** ☐ **YES** _____ cm.
Splenomegaly : ☐ **NO** ☐ **YES** _____ cm.
Transfusion History ☐ **NIL** yet
☐ **YES** _____ No./Year
Last transfusion date _____

Official stamp of Requesting Doctor
(Name, Signature & Date)

IMR/CaRC/HAEM/22/2203/03(1)/REQForm

KEBENARAN UNTUK UJIAN DNA

Maklumat ujian yang di jalankan: ***DNA ANALYSIS OF THALASSEMIA SYNDROMES & HAEMOGLOBINOPATHIES***

Nama Pesakit: ……..

ID Pesakit: ……..

Saya memahami penerangan yang berikut:

Ujian ini khusus untuk ****THALASSEMIA SYNDROMES & HAEMOGLOBINOPATHIES***

*Keputusan ujian **POSITIF** adalah indikasi bahawa saya terdedah kepada atau menghidapi penyakit/ keadaan yang tertentu. Oleh itu ujian lanjutan adalah diperlukan bagi mengesahkan penyakit tersebut.

*Sekiranya keputusan ujian **NEGATIF,** masih ada kemungkinan saya mempunyai masalah genetik tersebut dan ia tidak dapat dikesan disebabkan oleh limitasi teknologi kaedah ujian yang digunakan dan ilmu pengetahuan berkenaan perubahan DNA atau protein pada gen yang menyebabkan penyakit tersebut belum dikenalpasti.

*Ada juga kemungkinan keputusan ujian **TIDAK** dapat ditafsirkan atau **TIDAK** diketahui kepentingannya. Dalam keadaan tertentu, keputusan ujian mungkin menunjukkan keputusan yang tidak selaras dengan diagnosis asal yang telah dijangkakan.

1. Kebaikan ujian ini adalah untuk pengesahan diagnosis sesuatu penyakit dan mengenalpasti pembawa atau ahli keluarga yang berisiko tinggi mempunyai gen yang tidak normal.
2. Keputusan dan interpretasi yang tidak tepat berkemungkinan boleh berlaku berpunca daripada variasi DNA yang jarang pada seseorang individu, kesilapan teknikal yang tidak lazim, gabungan pembentukan tapak DNA yang tidak lazim oleh enzim yang digunakan untuk sesuatu ujian, kesilapan pengenalpastian identiti sampel, kontaminasi sampel, mutasi pada tapak *primer* dan kesilapan umum makmal.
3. Ketepatan interpretasi keputusan DNA bergantung kepada ketepatan maklumat diagnosis klinikal dan hubungan biologikal antara ahli keluarga pesakit.
4. Ujian DNA boleh mengenalpasti jika ibu/bapa adalah biologikal atau tidak.
5. Ujian yang ditawarkan adalah ujian yang terbaik boleh didapati pada masa ini. Jika teknologi dan mutasi (kecacatan gen) yang baru dapat dikesan pada masa akan datang , saya memberi kuasa kepada makmal untuk menganalisis semula sampel DNA tersebut tanpa perlu memaklumkan kepada saya. Jika sampel tidak mencukupi, doktor boleh memohon kepada saya untuk sampel yang baru. Berkemungkinan terdapat kos tambahan bagi ujian tersebut.
6. Bagi tujuan membantu saya memahami laporan keputusan ujian, ianya akan dimaklumkan kepada saya hanya melalui doktor atau kaunselor genetik.
7. Keputusan ujian ini digunakan **HANYA** untuk interpretasi klinikal
8. Keputusan ujian ini tidak boleh digunakan untuk apa-apa tujuan forensik atau **TIDAK SAH** untuk tafsiran forensik.
9. Keputusan ujian ini tidak boleh digunakan dalam mana-mana mahkamah undang-undang atau dalam hal-hal berkaitan perundangan dan **TIDAK SAH** untuk tafsiran undang-undang.

Bagi ujian prenatal, syarat-syarat berikut adalah termaktub:

1. Ujian DNA ini akan menentukan status fetus bagi penyakit berkaitan ujian ini **SAHAJA.**
2. Selain variasi DNA yang luar biasa dan kesilapan teknik, kesilapan hasil keputusan juga boleh berlaku sekiranya terdapat kontaminasi (pencemaran) bahan maternal ke dalam sampel fetus.

PERSETUJUAN TERMAKLUM BERTULIS

1. Suatu spesimen biologi (darah, tisu badan, cecair amniotic atau vilus korioni) akan diambil untuk ujian-ujian DNA bagi penyakit seperti di atas.
2. Selepas ujian DNA selesai, sebahagian DNA saya akan dilabel tanpa nama dan digunakan untuk tujuan pembelajaran, kawalan kualiti atau penyelidikan. Keputusan ujian tersebut tidak akan dimaklumkan kepada saya kerana sampel tersebut telah dilabel tanpa nama. Saya faham bahawa spesimen biologi yang diambil untuk tujuan ujian genetik adalah hak milik eksklusif Makmal IMR/HKL. Selepas ujian yang diminta selesai diproses, makmal berhak melupus, menyimpan atau menggunakan kembali spesimen tersebut untuk tujuan validasi atau pembelajaran.
3. Keputusan DNA adalah **SULIT** dan tidak akan didedahkan kepada sesiapa termasuk ahli keluarga atau individu selain doktor saya tanpa keizinan saya.
4. Sesetengah individu yang telah menjalani ujian DNA mungkin merasai diskriminasi (dari aspek insurans, pekerjaan dan masyarakat) apabila keputusan ujian DNA menunjukkan individu adalah pembawa gen yang menyebabkan penyakit tersebut.

Untuk diisi oleh:	
PESAKIT/IBUBAPA/PENJAGA SAH	**DOKTOR/KAUNSELOR**
Saya telah membaca dan menerima salinan borang kebenaran. Saya memahami isi kandungan di dalam dokumen ini dan mempunyai peluang untuk bertanyakan soalan tentang ujian, prosedur ujian dan risiko yang berkaitan, manfaat dan limitasi ujian. Saya setuju untuk menjalani ujian genetik ini dan menerima risiko & limitasinya. Tandatangan : Nama dan No IC: Tarikh:	Saya telah menerangkan sepenuhnya tentang ujian yang ingin dijalankan kepada pesakit/ibu bapa/penjaga yang sah. Tandatangan : Nama dan No IC: Tarikh:

MOLECULAR ANALYSIS FOR LEUKAEMIA

Hematology Unit, Cancer Research Centre,
Institute for Medical Research,
National Institutes of Health,
Jalan Setia Murni U13/52,
Seksyen U13 Setia Alam, 40170 Shah Alam, Selangor.

Phone: 03-3362 8653 / 03-3362 8657
Email: haematotranslocation@moh.gov.my/
leukaemia.mutation@moh.gov.my
Website: www.imr.gov.my

PATIENT INFORMATIONS:

Patient Name: Patient IC No.:	Ethnicity: ☐ Malay ☐ Chinese ☐ Indian ☐ Others; Please specify: _____	Gender: ☐ Male ☐ Female
Date of Birth:	Hosp/ Ward:	Hosp. Lab No.:
Age:	Type of Specimen:	
Address to send report:		
Tel/ Fax:	Date of Sampling:	Date Sent:

TEST REQUESTED

☐ Leukaemia Translocation Studies
(30 Common Leukaemia Translocations for Acute Leukaemia only)

☐ *BCR-ABL1* Qualitative Diagnostic Analysis
(For suspected cases of CML, MPN or MDS/MPN)

☐ Acute Myeloid Leukaemia Mutation Studies
☐ FLT3 ☐ c-KIT
☐ NPM1 ☐CEBPA

☐ *BCR-ABL1* Kinase Domain Mutation Analysis
(For suspected cases of resistance to tyrosine kinase inhibitor)
☐ p190 transcript ☐ p210 transcript
BCR-ABL1 transcript level: _____

CLINICAL DIAGNOSIS

☐Acute Lymphoblastic Leukaemia
☐ B-ALL
☐ T-ALL

☐ Acute Myeloid Leukaemia
FAB type:_____

☐ Chronic Myeloid Leukaemia
☐ Chronic phase
☐ Accelerated phase
☐ Blast phase

☐ Other diagnosis:
Please specify: _____

DISEASE STATUS

☐ New case
☐ Marrow assessment
☐ Remission
☐ Relapse
☐ Post-transplant
☐ Suspected resistance

CLINICAL HISTORY:

CURRENT TREATMENT:

Recent blood count:
- Blast count _____ - Hb _____
- WBC _____ - Platelet _____

Official stamp of Requesting Doctor:

Name, Signature & Date

IMPORTANT CHECKLIST; Please include with this form:
☐ A copy of FBC result
☐ A copy of BMA report
☐ A copy of Immunophenotyping report
☐ Unstained slides

HAEMOPHILIA GENETIC TESTING REQUEST FORM

Haematology Unit, Cancer Research Centre,
Institute for Medical Research,
National Institutes of Health,
Jalan Setia Murni U13/52,
Seksyen U13 Setia Alam,
40170 Shah Alam, Selangor.

Phone : 03-3362 8654 / 03-3362 8657
Email : haemophilia@moh.gov.my
Website : www.imr.gov.my

PATIENT INFORMATION:

Patient Name: Patient IC No.:	Ethnicity: □ Malay □ Chinese □ Indian □ Others; Please specify: _____	Gender: □ Male □ Female
Date of Birth:	Hosp/ Ward:	Hosp. Lab No.:
Age:	Type of Specimen:	
Address to send report:		
Tel/ Fax:	Date of Sampling:	Date Sent:

TEST REQUESTED:

□ Haemophilia A genetic testing
□ Haemophilia B genetic testing

INDICATION:

□ Diagnosis or suspected diagnosis of haemophilia
□ Family history of haemophilia
□ Known or suspected carrier for haemophilia

Name of index case: _____

Relationship of patient to index case: _____

Parental consanguinity: _____

CLINICAL FEATURES:

Age of onset: _____ year(s)
Bleeding tendency (eg: easy bruising) □ **YES** □ **NO**
Joint bleeding/swelling □ **YES** □ **NO**
If YES, No. of joint affected:
Please specify: _____

Bleeding post-surgery □ **YES** □ **NO**
Other symptoms indicating internal bleeding □ **YES** □ **NO**
Please specify: _____

CLINICAL SEVERITY:

□ Normal □ Mild □ Moderate □ Severe

FACTOR LEVEL : VIII: _____ IX: _____

FACTOR INHIBITOR : □ **YES** □ **NO**

If YES, what was the level? _____

CURRENT TREATMENT(s):

_____
_____
_____

Has anyone in this family ever had DNA testing for Haemophilia? □ **YES** □ **NO**
If YES, what was the result: _____

SPECIMEN AND TEST REQUIREMENTS/ CHECKLIST:

□ 2.5 ml of peripheral blood in EDTA tube
□ All carrier screening must be accompanied by an index sample with separate request form
□ A copy of the index and relative genetic test result (if available)
□ Family tree

Official stamp of Requesting Doctor:

Name, Signature & Date

KEBENARAN UNTUK UJIAN DNA

Maklumat ujian yang di jalankan: ***DNA ANALYSIS OF HAEMOPHILIA A & B***

Nama Pesakit: …… ID Pesakit: ……

Saya memahami penerangan yang berikut:

Ujian ini khusus untuk * ***HAEMOPHILIA A & B***

*Keputusan ujian **POSITIF** adalah indikasi bahawa saya terdedah kepada atau menghidapi penyakit/ keadaan yang tertentu. Oleh itu ujian lanjutan adalah diperlukan bagi mengesahkan penyakit tersebut.

*Sekiranya keputusan ujian **NEGATIF,** masih ada kemungkinan saya mempunyai masalah genetik tersebut dan ia tidak dapat dikesan disebabkan oleh limitasi teknologi kaedah ujian yang digunakan dan ilmu pengetahuan berkenaan perubahan DNA atau protein pada gen yang menyebabkan penyakit tersebut belum dikenalpasti.

*Ada juga kemungkinan keputusan ujian **TIDAK** dapat ditafsirkan atau **TIDAK** diketahui kepentingannya. Dalam keadaan tertentu, keputusan ujian mungkin menunjukkan keputusan yang tidak selaras dengan diagnosis asal yang telah dijangkakan.

1. Kebaikan ujian ini adalah untuk pengesahan diagnosis sesuatu penyakit dan mengenalpasti pembawa atau ahli keluarga yang berisiko tinggi mempunyai gen yang tidak normal.
2. Keputusan dan interpretasi yang tidak tepat berkemungkinan boleh berlaku berpunca daripada variasi DNA yang jarang pada seseorang individu, kesilapan teknikal yang tidak lazim, gabungan pembentukan tapak DNA yang tidak lazim oleh enzim yang digunakan untuk sesuatu ujian, kesilapan pengenalpastian identiti sampel, kontaminasi sampel, mutasi pada tapak primer dan kesilapan umum makmal.
3. Ketepatan interpretasi keputusan DNA bergantung kepada ketepatan maklumat diagnosis klinikal dan hubungan biologikal antara ahli keluarga pesakit.
4. Ujian DNA boleh mengenalpasti jika ibu/bapa adalah biologikal atau tidak.
5. Ujian yang ditawarkan adalah ujian yang terbaik boleh didapati pada masa ini. Jika teknologi dan mutasi (kecacatan gen) yang baru dapat dikesan pada masa akan datang, saya memberi kuasa kepada makmal untuk menganalisis semula sampel DNA tersebut tanpa perlu memaklumkan kepada saya. Jika sampel tidak mencukupi, doktor boleh memohon kepada saya untuk sampel yang baru. Berkemungkinan terdapat kos tambahan bagi ujian tersebut.
6. Bagi tujuan membantu saya memahami laporan keputusan ujian, ianya akan dimaklumkan kepada saya hanya melalui doktor atau kaunselor genetik.
7. Keputusan ujian ini digunakan **HANYA** untuk interpretasi klinikal
8. Keputusan ujian ini tidak boleh digunakan untuk apa-apa tujuan forensik atau **TIDAK SAH** untuk tafsiran forensik.
9. Keputusan ujian ini tidak boleh digunakan dalam mana-mana mahkamah undang-undang atau dalam hal-hal berkaitan perundangan dan **TIDAK SAH** untuk tafsiran undang-undang.

PERSETUJUAN TERMAKLUM BERTULIS

1. Suatu spesimen biologi (darah, tisu badan, cecair amniotic atau vilus korioni) akan diambil untuk ujian-ujian DNA bagi penyakit seperti di atas.
2. Selepas ujian DNA selesai, sebahagian DNA saya akan dilabel tanpa nama dan digunakan untuk tujuan pembelajaran, kawalan kualiti atau penyelidikan. Keputusan ujian tersebut tidak akan dimaklumkan kepada saya kerana sampel tersebut telah dilabel tanpa nama. Saya faham bahawa spesimen biologi yang diambil untuk tujuan ujian genetik adalah hak milik eksklusif Makmal IMR. Selepas ujian yang diminta selesai diproses, makmal berhak melupus, menyimpan atau menggunakan kembali spesimen tersebut untuk tujuan validasi atau pembelajaran.
3. Keputusan DNA adalah **SULIT** dan tidak akan didedahkan kepada sesiapa termasuk ahli keluarga atau individu selain doktor saya tanpa keizinan saya.
4. Sesetengah individu yang telah menjalani ujian DNA mungkin merasai diskriminasi (dari aspek insurans, pekerjaan dan masyarakat) apabila keputusan ujian DNA menunjukkan individu adalah pembawa gen yang menyebabkan penyakit tersebut.

Untuk diisi oleh:	
PESAKIT/IBUBAPA/PENJAGA SAH	**DOKTOR/KAUNSELOR**
Saya telah membaca dan menerima salinan borang kebenaran. Saya memahami isi kandungan di dalam dokumen ini dan mempunyai peluang untuk bertanyakan soalan tentang ujian, prosedur ujian dan risiko yang berkaitan, manfaat dan limitasi ujian. Saya setuju untuk menjalani ujian genetik ini dan menerima risiko & limitasinya. Tandatangan : Nama dan No IC: Tarikh:	Saya telah menerangkan sepenuhnya tentang ujian yang ingin dijalankan kepada pesakit/ibu bapa/penjaga yang sah. Tandatangan : Nama dan No IC: Tarikh:

BONE MARROW CYTOGENETICS

Genetic Laboratory
Haematology Unit, Cancer Research Centre
Institute for Medical Research
Jalan Pahang
50588 Kuala Lumpur, Malaysia

Phone : 03-2616 2711
Fax : 03-2616 2530
Website : http://www.imr.gov.my

Specimen requirements:

1. ***Chromosome analysis***: Please send at least 2mL of FIRST bone marrow aspirate or blood ***(white blood count is >10,000 WBC/mL and at least 20% blasts)*** into sterile transport medium available from Genetic Laboratory. Transport as soon as possible. Protect from extreme heat and freeze.

2. ***Chromosome breakages***: An appointment is necessary for the performance of this analysis. Please contact the Genetic Laboratory for further instruction. Please send 10mL peripheral blood in sterile lithium heparin tube. A control sample, matched for age and sex is required.

FOR GENETIC LAB USE ONLY

Genetic No. : BM
Serial No. :

Previous Cytogenetic Result:

PATIENT INFORMATION

1. Patient Name :		2. IC No. :
3. Age :	4. Ethnicity : ☐ Malay ☐ Chinese ☐ Indian ☐ Others; Please specify: _____	5. Gender : ☐ Male ☐ Female
6. Clinical History :		7. Address to send test report :

CLINICAL DIAGNOSIS

Acute Lymphoblastic Leukaemia
Acute Myeloid Leukaemia
FAB type: _____
Chronic Myeloid Leukaemia
Chronic phase Accelerated phase
Blast phase
Myeloproliferative Neoplasms
Myelodysplastic Syndrome
Myelodysplastic/Myeloproliferative Neoplasms
Multiple Myeloma
Lymphoma
Please specify: _____
Chronic Lymphocytic Leukaemia
Aplastic Anaemia
Others: _____

SPECIMEN INFORMATION

Date Drawn : ___/___/_____ Time : _____
Date Sent : ___/___/_____ Time : _____

Specimen Type:

Bone Marrow Aspirate
Volume of aspirates: _____mL

Peripheral Blood
WBC count: _____WBC/mL % Blast: _____

TEST REQUESTED

Chromosome Analysis
Chromosome Breakages
FISH
BCR/ABL PML/RARA

FISH analysis: Unless otherwise specified, this test will be done on selective cases under the discretion of the Laboratory Supervisor.

DISEASE STATUS

New Case
Marrow Assessment
Remission
Relapse
Post-Stem Cell Transplant
Sex of Donor
Male Female

Official stamp of Requesting Doctor:

Name & Signature

Date:

HOSPITAL AMPANG SPECIAL HAEMATOLOGY REQUISITION FORM

Clinical Haematology Referral Laboratory, Level 2, Hospital Ampang, 68000 Ampang, Selangor

☎ 03-42896219 📠 03-42970059

Lab use only
Date / Time received:

Lab No.

PATIENT

Name _____

I/C ☐☐☐☐☐☐○○☐☐☐☐

Age_____ Malay / Chinese / Indian / Other_____ Male / Female

Ward, Hospital_____

CLINICAL, THERAPY & TRANSFUSION HISTORY

Incomplete clinical history will compromised test interpretation

Reason for sampling Do you require **expedite** result? ☐

Diagnosis_____

CONSENT YOUR SIGNATURE CONFIRMS THAT YOU HAVE OBTAINED PATIENT'S CONSENT FOR USAGE OF THIS EXTRACTED DNA & RNA FOR ASSAY OPTIMISATION. THIS USAGE WILL BE ANONAMISED AND WILL NOT BE LINKED TO THIS PATIENT.

SIGNATURE _____

DOCTOR'S NAME_____

MOBILE NO _____

Signature verifies the identity of this sample. Any edit should be initialed.
Incomplete requisition form **will** result in **sample rejection.**

SAMPLE

Sampling: Date _____ **Time**_____
(Date & Time of sampling is COMPULSORY)

Marrow Trephine ☐ ☐ Blood ☐ CSF ☐ Lymph Node ☐
Other_____

MORPHOLOGY ☎ 03-42896532

☐ FBP ☐ Retic ☐ IPF ☐ Bone Marrow Aspirate ☐ Iron Stain
☐ Cytospin

CYTOGENETICS ☎ 03-42896055
(Transport medium preferred; Na Heparin acceptable)

☐ **FISH**_____ 'Y' Chimerism (Donor ☐ Male ☐ Female)
☐ Hypereosinophilia ☐ **KARYOTYPE**

FLOW CYTOMETRY (EDTA) ☎ 03-42896218

☐ Leukemia/ Lymphoma ☐ MRD ☐ PNH

MOLECULAR (EDTA) ☎ 03-42896056

☐ JAK2 V617F ☐ PML-RARα ☐ RUNX1-RUNX1 T1
☐ BCR-ABL1 ☐ CBFβ-MYH11 ☐ FLT3-ITD / NPM1
☐ CALRETICULIN ☐ Other, specify

HEMOSTASIS (TRISODIUM CITRATE 3.2%) ☎ 03-42896461

☐ Coagulation Profile ☐ Inhibitor Screen ☐ Protein C
☐ Factor Assay ☐ Inhibitor Titer ☐ Protein S
☐ Anti XA [LMWH] ☐ VWD screen ☐ Anti-thrombin
☐ D-Dimer ☐ Lupus Anticoagulant ☐ ADAMTS-13 activity / inhibitor

RED CELL ☎ 03-42896217

☐ Hb Analysis (EDTA) ☐ sEPO (Plain tube)
☐ H Inclusion ☐ Heinz Bodies ☐ Kleihauer

HAEMATOPATHOLOGY ☎ 03-42896222

Site of biopsy _____

Biopsy Trucut / Excision Block No_____

Slides No_____ Unstained / Stained

☐ External _____

OTHERS

_____

Guidelines on reverse

[Hem-RQ19.ver4. 31.Aug.20212

Bone Marrow Procedure Documentation – Lab Use Only

Date &Time of Marrow_____ ¶FBP ◯

Dr_____ Nurse_____MLT_____

Site of Marrow PSIS Right Left Condition of Sample Good Clotted Dry Tab

Aspirate◯ Trephine◯ Trephine Roll◯ Number of smears_____ Cytogenetics◯ Flow◯ Molecular◯

MGG Date____/____/____ Time_____ MLT_____

GUIDELINES FOR SAMPLING

General
Any questions/ urgent requests please ***call lab and/or Lab Haematology MO on-call*** [contactable via Hospital operator, 03-42896000] prior to obtaining sample; especially if sampling on Friday or eve of Public Holidays.
Invert tube several times to ensure adequate mixing. ***Transport*** samples without delay at room temperature [unless otherwise indicated]. ***Body fluids/ CSF*** should reach lab within 1 (ONE) hour of sampling.
Unless otherwise indicated, all tests are available Monday-Friday 8am to 5pm.

Bone marrow sample for morphology
Bone marrow sample for morphology should be accompanied a ¶sample for FBP if there has been none in previous 2 days.
To avoid aspiration artifact **ALWAYS obtain trephine sample at a site of different from aspiration.**

FLOW CYTOMETRY (EDTA) ☎ 03-42896218

EDTA **Marrow 2ml; Blood 5ml**
Body fluids use special medium obtained from cytogenetic lab if the sample is clear. If the sample is **bloody**, use a K2 EDTA tube for transportation.
CSF use microtube filled with special medium obtained from cytogenetic lab.
All samples for flow should reach lab by 4 pm. Call and inform the lab.

CYTOGENETICS (Karyotyping & FISH) ☎ 03-42896055

If ordering both tests, **one** tube is adequate.
Transport medium is always preferred (available from the lab); however; Na Heparin [do not use Li Heparin] can be used if transport medium is not available.
Marror 2ml, **Blood** 5ml in sterile transport medium; if Na Heparin is used, send 2 tubes of 5ml blood.

MOLECULAR (EDTA) ☎ 03-42896056; ampanglab@gmail.com

EDTA tube **Marrow** ~2ml; **Blood** 5ml
For **BCRABL1 monitoring of CML** only: send 15ml of blood.

HEMOSTASIS (TRISODIUM CITRATE 3.2%) ☎03-42896461

Please discuss with hematologist prior to obtaining sample to avoid rejection.
3.2% TriSodium Citrate of 3ml plasma is required for;
Factor assay (3 tubes),
Lupus anticoagulant (4 tubes) [double spin],
ADAMTS-13 (2 tube) [double spin],
Anti-Xa [double spin].
Centrifuge sample, aliquot plasma into a new plain tube, freeze immediately at -80°C. Transport frozen in dry ice.
Anti-Xa [LMWH] - Through level, please discuss with haematologist
- Peak level, 4 hours after dose.

RED CELL ☎03-42896217

sEPO, plain tube – Separate plasma into a new plain tube, freeze immediately at -80°C. Transport frozen.

SERVICE AGREEMENT

Change in service shall be reflected in explanatory information and laboratory reports. Customers or users shall be informed of deviations from the agreement that impact upon the examination results.

BONE MARROW CYTOGENETICS

Cytogenetic Lab, Haematology Unit, Department of Pathology
Hospital Pulau Pinang, Jalan Residensi
10990 Georgetown, Penang.

Phone: 04-222 5652
Fax : 04-222 5155

Specimen requirements

1. Please send 4ml of bone marrow aspirate or peripheral blood (> 20% blast) in Sodium heparin tube. Lymph node sample should be sent in Normal Saline.
2. Transport as soon as possible to the lab. Protect from extreme heat or freeze.

FOR LAB USE ONLY:

Previous Cytogenetic results

PATIENT INFORMATION

PATIENT NAME:		IC NUMBER:
AGE:	ETHNICITY:	GENDER: ☐ MALE ☐ FEMALE
WARD/ HOSPITAL:	ADDRESS TO SEND REPORT:	

CLINICAL DIAGNOSIS

- ☐ Acute Lymphoblastic Leukemia
- ☐ Acute Myeloid Leukemia
- ☐ Chronic Myeloid Leukemia
  - ☐ Chronic Phase
  - ☐ Accelerated Phase
  - ☐ Blast transformation
- ☐ Chronic Lymphocytic Leukemia
- ☐ Myeloproliferative Disorders
- ☐ Myelodysplastic Syndromes
- ☐ Aplastic Anemia
- ☐ Lymphoma

  Please specify:
- ☐ Multiple Myeloma
- ☐ Others:.....

DISEASE STATUS

- ☐ New case ☐ Relapse
- ☐ Marrow Assessment
- ☐ Remission
- ☐ Autologous Stem Cell Transplant
- ☐ Allogenic Stem Cell Transplant
  - ☐ Male Donor
  - ☐ Female Donor

SPECIMEN INFORMATION

Date sample taken:.....Date Sent:.....

Specimen Type: ☐ Bone marrow aspirate
☐ Peripheral blood
☐ Lymph node (in Normal Saline)

TEST REQUESTED:

☐ Chromosome Analysis
☐ FISH
☐ BCR/ABL ☐ PML/RARA

Unless otherwise specified, FISH test will be done on selective cases under the discretion of the Laboratory Supervisor.

CLINICAL SUMMARY:

Name, Signature, Date and Official Stamp of requesting doctor.

19 DECEMBER 2017

Acute Flaccid Paralysis Case Investigation Form

Ministry of Health, Malaysia

1 CASE I.D. + PLACE

Name:		Gender:	DOB:	Age:	Hospit Regist No.:
Mother's N:		District:	State:		
Residenrial Address:					

2 REFERRAL + REPORTING

Child initially seen at:			Date first seen:
Date of report to EPI/MOH:		Person reporting:	
Report from where? (Institution):		Attending physician:	
Remarks:			

3 HISTORY + PHYSICAL EXAMINATION

Onset of paralysis (date) : | No. of days to maximum paralysis:

Main history source: 1.Parents 2.Chart 3.Doctor/Nurse

At onset (paral.): Fever: Y/N | Diarrhoea: Y/N | Cough: Y/N

PAST HISTORY (last 30 days):		ON EXAMINATION (date) :		SITE OF PARALYSIS:	
Injections ?	Yes / No	FLACCID Paralysis?	Yes / No	(grade mot. strength: 0=abs. to 5=full)	
Recent trauma or animal bite?	Yes / No	Meningeal signs (stiff neck):	Yes / No	left arm :	right arm :
Any existing neurologic disease?	Yes / No	Paralysis symmetric/asymm.?	Symmetric / Asymm	left leg:	right leg:
Any recent travel? (Specifiy below)	Yes / No	Deep tendon reflexes:	Norm. / Red. / Abs.	respirator: yes / no	face: yes / no
Similar case among contacts?	Yes / No	Any sensory loss?	Yes / No	others (specify): _____	

Remarks: _____

4 PRELIMINARY DIAGNOSIS: **A F P: Yes**

IF YES: 1. Poliomyelitis | 2.Guillain-Barre | 3. Transverse Myelitis | 4. Traum. Neuritis | 5. Myasthenia Gravis | 6.Viral Myositis

7. Periodic Paralysis | 8. Demyelinating Diseases | 9. Cord Compression Diseases | 10. Others:

Name of investigator:	Date:	Signature:
Address of investigator:		
Remarks:		

5 IMMUNISATION HISTORY

Immunisation card available? | Total No. of OPV doses received:

Main reason for not fully immunised: 1.not informed 2.illness 3.refusal 4.unknown 5.other:

Dates: OPV1: Y/N	OPV(2):	OPV(3):	OPV(4):	OPV(4):	OPV(6):	OPV(7):	IPV/OPV(5)
Recent OPV to contact? Y/N | Date ___|___|___		Date 1.outbreak response immunis. ___|___|___			Number immunised: _____		% of eligible: ____
Remarks:							

6 LAB. INFO

	Date collected:	Date sent:	Date rec. IMR:	Pos. CPE (IMR):	IMR: PV-Type	Date sent to Ref.:	Ref.-Lab. Result:
Stool 1 : Yes / No	____|____|____	____|____|____	____|____|____	Yes / No	1 | 2 | 3	Negative	wild/vacc. | T: 1|2|3
Stool 2 : **Yes** / No	____|____|____	____|____|____	____|____|____	Yes / No	1 | 2 | 3	____|____|____	wild/vacc. | T: 1|2|3

Remarks:

7 FOLLOW-UP Date:

Case examined >= 60 days after onset paralysis? Yes / No | Date of examination:

If not seen, why not? _____ | Paralysis/Weakness still present? Yes / No

Site of residual paralysi: Right leg: **Y** / N | Left leg: Y / N | Right arm: Y / N | Left arm: Y / N | Face: Y / N | Other:

Ability to walk: 1. Cannot walk 2. Walks with assistance 3. Limps 4. Walks normally | Exam. physician:

Remarks:

8 FINAL DIAGNOSIS - DATE: (CONFIRMED POLIO or discarded as polio; Expert Review Committee)

1. CONFIRMED	> Virus isolation: Yes / No | Residual paralysis: Yes / No | Death: Yes / No | Lost to follow-up: Yes / No
2. DISCARDED	1. Guillain-Barre | 2. Transverse Myelitis | 3. Traumatic Neuritis | 4. Unknown | 5. Other_____

Remarks:

NOTE : Please Fax AFP Case Investigation form to:

1. Disease Control Division, MOH (Fax No. 03 - 88886270)
2. Virology Department, Institute for Medical Research (IMR), KL (Fax No:03 - 26936323) with adequate stool samples.
3. Nearest District Health Office

Second AFP Case Investigation form should be sent after 60 days with followup result to the above fax.

INSTITUTE FOR MEDICAL RESEARCH MALAYSIA

ALLERGY REQUEST FORM

Allergy Unit
Allergy & Immunology Research Centre (AIRC)
Institute for Medical Research (IMR)
National Institutes of Health (NIH)
No 1, Jalan Setia Murni U13/52
Seksyen U13 Setia Alam, 40170 Shah Alam, Selangor
No Tel: 03-33628385
Email: allergyimrkl@gmail.com

For IMR Lab No. ONLY

1. Name:	2. R/N:
3. I/C No.:	4. Date of Birth:
5. Age:	6. Gender:
7. Race :	8. Ward/Clinic:
9. Requesting Doctor:	10. Hospital:

11. Clinical and Allergy History:

12. Diagnosis:

13. Related Atopic Disease (Please tick if relevant):

- ☐ Bronchial Asthma
- ☐ Eczema
- ☐ Allergic Rhinitis
- ☐ Allergic Eye Disease
- ☐ Urticaria
- ☐ Others : (Please specify)

.....

For IMR Allergy Laboratory Use ONLY

14. Test Required : (Please tick only appropriate test)

No.	Test	Tick
i.	Total IgE	
ii.	Specific IgE:	
iii.	Tryptase	

15. Specimen Collection Details:

Date:.....

Time:.....

16. Applicant's Name (Signature & Stamp):

IMPORTANT NOTICE: To ensure correct and reliable result given, please fill up the entire form and the following must be followed:

1. **Please refer to next page for specimen collection instructions.**
2. **Spin/separate plasma/serum from RBC immediately. Grossly haemolysed samples will be rejected.**

Sample Collection Instruction

No	Tests	Specimen Type	Vacutainer	Specimen Collection	LTAT (Working days)
1	Total IgE	Blood	Plain tube (3 mL)	1 plain tube	10
2	Specific IgE	Blood	Plain tube (3 mL)	Minimum 1 plain tube	10
3	Tryptase	Blood	Plain tube (3 mL) (store at 2 - 8°C)	1 plain tube *Timing of samples collection* 1. After anaphylaxis: • 1st sample within 15 minutes up to 3 hours after the onset of the symptoms • 2nd sample after 24-48 hours to confirm the return to baseline levels • 3rd sample after 1-2 weeks if incidents of mastocytosis or other causes of elevated basal levels are suspected 2. Sample required other than anaphylaxis, as per clinician's request/indication	14

* *Private hospital/laboratory are advised to call the Allergy Unit prior to sending sample(s).*

*** Sample(s) from East Malaysia are suggested to be transported in ice.*

AUTOIMMUNE REQUEST FORM

Autoimmune Unit, Allergy & Immunology Research Centre (AIRC)
Institute For Medical Research (IMR)
National Institute of Health (NIH)
Seksyen U13 Setia Alam, 40170 Shah Alam, Selangor
Contact No : 03 3362 8381
Email : autoimununit@moh.gov.my

	Free
	Paid

Resit No.:

1. Name:	2. R/N :
3. I/C No.:	4. Ward/Clinic:
5. Age: Race:	6. Hospital:
7. Gender: ☐ Male ☐ Female	8. Specimen type: ☐ Serum ☐ CSF
9. A) Clinical history:	B) Diagnosis:

10. Test Required : (Please tick **ONLY ONE** appropriate test / required)

No	Test Name	Please Tick
1.	Anti-Acetylcholine Receptor Antibody (**ACHR**)	
2.	Anti-Aquaporin 4 (**AQ4**)	
3.	Anti-Glomerular Basement Membrane (**GBM**)	
4.	**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)	
5.	Anti-N-Methyl-D-Aspartate Receptor (**NMDAR**)	
6.	**Coeliac Antibodies** Panel Anti-Endomysium, Anti Gliadin, Anti Tissue Transglutaminase	
7.	**Cytokine Test** Panel: IL-1b, IL-6, IL-8 & TNF-a *(By appointment only)*	

No	Test Name	Please Tick
8.	Phospholipase A_2 Receptor antibody (**PLA2R**)	
9.	**Paraneoplastic Neurological Syndrome** (**PNS**) Panel: Anti-Tr (DNER), Anti-GAD65, Anti-Zic4, Anti-TItin, Anti-SOX1, Anti-Recoverin, Anti-Amphiphysin, Anti-Ma2/Ta, Anti-Yo, Anti-Ri, Anti-Hu, Anti-CV2	
10.	**Skin Antibodies** Panel Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3	
11.	**Specific Liver Antibodies** (**SLA**) Panel Anti-AMA-M2, M2 3E/BPO, Sp100, PML, gp210, LKM1, LC-1, SLA/LP, Ro-52. **COMPULSORY** to specify the tissue antibody results (please tick in the box below):	

Test	Detected	Not Detected
AMA		
ASMA		
LKM		

IMPORTANT NOTICE : To ensure correct and reliable result given, please fill up the entire form and following must be followed:

1. ***3.5 ml blood in plain tube or gel tube is required for each test (Please send one tube and request form per test).***
2. ***Separate plasma/serum from RBC immediately. Grossly hemolysed samples will be rejected.***
3. ***All samples (serum/ CSF) must be kept and transport in cool temperature, 2-8 ºC (transport in ICE to IMR).***
4. ***Please enclose the screening test results along with this form for test No. 11 (SLA).***

11. Specimen Collected Date Date: ☐☐☐☐☐☐ Time: ☐☐☐☐

12. Applicant's name:……..

13. Date: …… ……

Signature & Stamp

BACTERIOLOGY REQUEST FORM

Bacteriology Unit, Infectious Diseases Research Centre (IDRC)
Institute For Medical Research (IMR),
National Institutes of Health (NIH)
No 1, Jalan Setia Murni U13/52, Seksyen U13, Setia Alam,
40170 Shah Alam, Selangor
Phone: 03-3362 8349 Email: bacteriology@moh.gov.my

1. Name:		2. R/N:
3. I/C No.:		4. Ward/Clinic:
5. Age:	Race:	6. Hospital:
7. Gender: Male Female		8. Specimen type:
9. Clinical history/Laboratory information:		
10. Diagnosis:		

11. Test Required: (Please tick appropriate test required)

No.	Test Name	Please tick	No.	Test Name	Please tick
1	Identification of anaerobic bacteria - *Antibiotic susceptibility testing not offered*		7	*Bordetella pertussis* PCR	
2	Identification of aerobic bacteria - *Including PCR for 16S RNA, EHEC identification, Elek test and PCR for B. pseudomallei*		8	Carbapenemase genes detection (CRE) - *May include MIC Colistin and MCR-1 Gene Detection*	
			9	Detection of *Burkholderia pseudomallei* IgM (Meliodosis)	
3	Antibiotic susceptibility testing - *Not a standalone test, to proceed after aerobic bacterial identification test*		10	Fungal tests *-Please fill up Mycology request form*	
			14	PFGE for *Salmonella* Typhi - *By consultation only*	
4	Verification of antibiotic resistance - *May include MIC Colistin for required cases*		15	*S. pneumoniae* isolate confirmation & AST verification	
5	Vancomycin resistant *Enterococci* (VRE) isolate confirmation & AST verification		16	*S. pneumoniae* serotyping Antibiotic susceptibility: Ceftriaxone ☐S ☐I ☐R Co-trimoxazole ☐S ☐I ☐R Erythromycin ☐S ☐I ☐R Penicillin ☐S ☐I ☐R Amoxicillin/clavulanic acid ☐S ☐I ☐R	
6	CA-MRSA PCR				

PLEASE FILL UP SPECIFIED REQUEST FORMS FOR FOLLOWING TESTS
(https://www.imr.gov.my/index.php/en/services/2760-diagnostic-service-forms):

1. *Brucella* PCR
2. *Brucella* serology
3. Leptospiral micro-agglutination test (MAT)
4. Leptospiral PCR
5. *Rickettsia* serology
6. *Mycobacterium tuberculosis* (MTB) PCR
7. Atypical Mycobacterium infection or Mycobacteria other than Tuberculosis (MOTT) PCR
8. Mycology request form

IMPORTANT NOTICE : To ensure correct and reliable result given, please fill up the entire form and following must be followed :
1. Please refer to IMR test list (https://www.imr.gov.my/testlist) for specimen type.

12. Specimen Collected Date Date: Time:

13. Applicant's name:……..

14. Date: …… ……
Signature & Stamp

IMR/BACT/FORMS/SMIS/01 Version 4.0 Revised date: 1/7/2022 Approved by: Head of Bacteriology Unit, IDRC

BACTERIOLOGY UNIT
INFECTIOUS DISEASE RESEARCH CENTRE (IDRC)
INSTITUTE FOR MEDICAL RESEARCH (IMR)
NATIONAL INSTITUTES OF HEALTH (NIH)
NO 1, JALAN SETIA MURNI U13/52, SEKSYEN U13, SETIA ALAM, 40170, SHAH ALAM, SELANGOR
Tel: 03-3362 8358
EMAIL: bacteriology@moh.gov.my

IMR/BACT/FORMS/BRUCE/02

BRUCELLOSIS LABORATORY REQUEST FORM

PATIENT'S INFORMATION			
Name:		Age:	DOB: __/__/____
Identification card (IC) / Passport No:	R/N:	Gender: ☐ M ☐ F	
Ethnicity: ☐ Malay ☐ Chinese ☐ Indian ☐ Others (*please specify*): _____	Nationality: ☐ Malaysian ☐ Non-Malaysian _____		
Address:			
Date of admission:	Patient's Occupation:		
Hospital:	Ward/ Clinic:		
Name and stamp of requesting Doctor:	Signature of Dr:		

CLINICAL SUMMARY			
Diagnosis:			Date of diagnosis:
Duration of illness:_____days			
Signs & Symptoms:	☐ Fever, duration: ___	☐ Myalgia	☐ Endocarditis
	☐ Recurring fever	☐ Arthralgia	☐ Osteomyelitis
	☐ Night sweats	☐ Loss of appetite	☐ Arthritis or spondylitis
	☐ Headache	☐ Hepatomegaly	☐ Epididymo-orchitis
	☐ Weakness	☐ Splenomegaly	☐ Meningitis
	☐ Others:		

PAST HISTORY	
☐ Drink unpasteurized milk ☐ Goat ☐ Cow ☐ Others (*please specify*):	
☐ Consumed unpasteurized dairy products (*please specify*):	
☐ Work with animals or animal products	☐ Veterinarian ☐Abattoir worker ☐ Farmer ☐ Researcher ☐ Handling animal parturition ☐ Others (*please specify*):
☐ Case or household member works or lives in farm	
☐ Travelled abroad over past 6 months (*please specify*): _____	

SPECIMEN INFORMATION		**LABORATORY INFORMATION**
Type of specimen:	☐ Blood in EDTA for PCR ☐ Serum for ELISA ☐ Culture isolate for identification ☐ Culture isolate for PCR	Date of specimen received: __/__/ ____ Date of test performed: _/ __/ _____ Result of test:
Date of specimen collection:		

IMR/IDRC/VIRO/ADMIN/53

For IMR use only:

VIROLOGY TEST REQUEST FORM

Virology Unit, Infectious Diseases Research Centre (IDRC)
Institute For Medical Research (IMR), National Institutes of Health (NIH)
No 1, Jalan Setia Mumi U13/52, Seksyen U13, Setia Alam, 40170 Shah Alam, Selangor

Phone: 03-3362 8960
Email: virologi@moh.gov.my

1. Name:
2. R/N:
3. I/C No.:
4. Ward/Clinic: 5. Age: 6. Race:
7. Gender: ☐ Male ☐ Female
8. Hospital:
9. Specimen type:
10. Clinical History/Laboratory information:
11. Diagnosis:

No.	Test Offered	Please tick
1.	Respiratory Virus Isolation and Identification:	
	Influenza Virus A and B	
	Adenovirus	
	Respiratory Syncytial Virus	
	Parainfluenza Virus 1, 2 and 3	
	Human Metapneumovirus	
2.	Enterovirus Isolation:	
3	Herpes Simplex Virus (HSV-1 & HSV-2) Isolation	
4	Cytomegalovirus Isolation	
5	Adenovirus qRT-PCR	
6	Chikungunya qRT-PCR	
7	Dengue Multiplex qRT-PCR (DENV-1, -2, -3 & -4)	
8	Enterovirus qRT-PCR (Inclusive of Pan-Entero, EV71 & CA16)	
9	Japanese Encephalitis, JE qRT-PCR	
10	Influenza A and B qRT-PCR	
11	Nipah Virus Antibody	
12	Hepatitis A IgM virus Antibody	
13	Hepatitis B core IgM (HBc) Antibody	
14	Hepatitis B core (HBc) Total Antibody	
15	Hepatitis B envelope (Hbe) Antibody	
16	Hepatitis B envelope Antigen (HBeAg)	
17	Hepatitis B surface (HBs) Antibody	
18	Hepatitis B surface (HBsAg) Antigen	
19	Hepatitis C virus (HCV) Antibody	
20	Hepatitis C RNA Viral Load	
21	Hepatitis C Genotyping	
22	HIV Viral Load	

PLEASE FILL UP SPECIFIED REQUEST FORMS FOR FOLLOWING TESTS
(httQS://www.imr.gov.mx/index.QhQ/en/services/2760-diagnostic-service-forms):

1	Polio Virus and Non-Polio Virus (Acute Flaccid Paralysis)	
2	Confirmation for HIV 1 / 2	
3	HIV-1 RT PCR (Qualitative)	
4	HIV-1 RNA RT PCR for babies (0-18 months)	
5	HIV-2 qRT-PCR (By Consultation Only)	
6	HIV Drug Resistance Test (Protease and Reverse Transcriptase)	
7	HIV Drug Resistance Test (Integrase)	
8	SARI Surveillance (Influenza A, B dan SARS-CoV-2 qRT-PCR) ***Test is for selected sentinel labs only**	

No.	Test Offered (BY CONSULTATION ONLY)	Please tick
1.	MERS- Coronavirus qRT-PCR	
2.	Influenza Subtyping (pdm09 and H3 seasonal) qRT-PCR	
3	Rift Valley Fever Virus	
4	Ebola Virus	
5	Marburg Virus	
6	Lassa Virus	
7	Crimean Congo Haemorrhagic Fever Virus (CCHFV)	
8	Severe Fever with Thrombocytopenia Syndrome (SFTS)	
9	St Louis Encephalitis Virus (SLEV)	
10	West Nile Virus	
11	Yellow Fever Virus	
12	Measles Virus	
13	Rabies Virus	
14	Zika Virus	
15	Novel Coronavirus qRT-PCR	
16	Viral Isolation Novel Coronavirus	
17	Avian Influenza (H5/H7/H9)	
18	Forensic Cases Novel Coronavirus qRT-PCR	
19	Hanta Pulmonary Syndrome (Sin Nombre Orthohantavirus)	
20	Hanta Renal Syndrome (Seoul & Hantaan Virus)	
21	Real Time PCR for Single Target Virus	
22	Adenovirus F41 qRT-PCR	
23	Hepatitis D IgM	
24	Hepatitis E IgM	
25	SARS-CoV 2 Antibody	
26	Monkeypox qRT-PCR	

IMPORTANT NOTICE:
To ensure correct and reliable result given, please fill up the entire form and following must be followed:
Please refer to IMR test list (https://www .imr.gov.my /testlist) for specimen type.

Specimen Collected Date
Date: Time:

Applicant's name:
Date:

Signature & Stamp:

Version 1.1 Issued Date: 22 /06/2022 Approved by: Head of Virology Unit, IDRC

IMR/Viro/HIV/24

HIV Genotyping Resistance Testing

Virology Unit, Infectious Diseases Research Centre (IDRC)
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Phone: 03-3362 8960
Email: virologi@moh.gov.my

LAB NO:
Please write clearly in black ink

SENDER'S INFORMATION

Sender's name and address:

Phone: Ext:

PATIENT/SOURCE INFORMATION

RN: Hospital name (if different from sender's name)

Name: Ward/Clinic name:

Sex ☐ Male ☐ Female

Date of birth: Age:

SAMPLE INFORMATION

Sanple type ☐ Plasma

Consent for leftover sample to be used in other assays?
☐ Yes ☐ No

Date and time of collection:

Date sent to IMR:

TEST REQUESTED

HIV Genotyping Resistance Testing

☐ RT and Protease ☐ Integrase

CLINICAL /EPIDEMIOLOGICAL INFORMATION

Reason for test
- ☐ New diagnosis
- ☐ Treatment failure
- ☐ Poor response to new regime
- ☐ Starting ART 1st time
- ☐ Re-starting ART after drug interruption
- ☐ Acute primary infection seroconverter
- ☐ Pregnancy
- ☐ Other (Please specify)

Adherence
- ☐ Poor
- ☐ Excellent
- ☐ Reasonable
- ☐ No opinion

Most recent viral load at time of sample _____copies

Date of most recent viral load

Patient on therapy when sample was taken? ☐ Yes* ☐ No
Has patient ever on therapy? ☐ Yes* ☐ No

***Details of Current/Previous Therapies:**

NRTIs	Current/ most recent	Previous	**PIs**	Current/ most recent	Previous
ZDV	☐	☐	APV	☐	☐
D4T	☐	☐	fosAPV	☐	☐
ddI	☐	☐	ATV	☐	☐
3TC	☐	☐	IDV	☐	☐
FTC	☐	☐	NFV	☐	☐
ABC	☐	☐	LPV/r	☐	☐
DdC	☐	☐	RTV	☐	☐
TDF	☐	☐	(any dose)		
NNRTIs			**INSTIs**		
NVP	☐	☐	BIC	☐	☐
EFV	☐	☐	CAB	☐	☐
ETV	☐	☐	DTG	☐	☐
SQV	☐	☐	EVG	☐	☐
DRV	☐	☐	RAL	☐	☐
TPV	☐	☐			

OTHER COMMENTS

REFERRED BY

Doctor's name Signature Date

Version No: 2.0 Issued Date: 01 October 2021 Approved by: Head of Virology Unit

IMR/Viro/HIV/2 *IMR/VIRUS/NARL2*

UJIAN POLYMERASE CHAIN REACTION (PCR) UNTUK HUMAN IMMUNODEFICIENCY VIRUS (HIV) DI KALANGAN BAYI

Spesimen yang diperlukan: 2.5ml darah **EDTA** dari bayi
Darah hendaklah dihantar serta-merta kepada Makmal Rujukan Kebangsaan AIDS (NARL), Institut Penyelidikan Perubatan, Institut Kesihatan Negara, Setia Alam,Selangor. Tel: 03-3362 8114

Hospital:			Wad/Clinic:	
No NARL Untuk Kegunaan NARL Sahaja	Nama Pesakit:		No Pendaftran: No K/P:	
	Tarikh Lahir:	Umur:	Jantina:	Keturunan:
	AZT diberikan: O Tidak O Ya, tarikh diberi dari: hingga			
	Kesan-kesan klinikal: O Asimptomatik O Simptom: (nyatakan)			
No NARL Untuk Kegunaan NARL Sahaja	Nama Ibu:		No Kad Pengenalan/Passport:	
	Umur:	Keturunan:	Aktiviti risiko (jika ada):	
	AZT diberikan masa antenatal: OTidak OYa, tarikh diberi dari: hingga			
	Keputusan ujian anti-HIV: O Positif O Negatif		Makmal yang menjalankan ujian:	
	Nama Bapa:		No Kad Pengenalan/Passport:	
	Umur:	Keturunan:	Aktiviti risiko (jika ada):	
	Keputusan ujian anti-HIV: O Positif O Negatif		Makmal yang menjalankan ujian:	
Tarikh darah di ambil:				

Nama doktor yang minta ujian:

_____

_____
Tandatangan

Chop:

Untuk Kegunaan NARL:	
Blood Received:	
Received: O Clotted O EDTA O Serum _____ml	O Plasma (____ml) O Serum (____ml) O Clear O Lysed O Turbid

No Tel :

Tarikh : _____

Version 3.0 Date: 06 May 2022 Approved by: Head, Virology Unit

BACTERIOLOGY UNIT
INFECTIOUS DISEASES RESEARCH CENTRE (IDRC)
INSTITUTE FOR MEDICAL RESEARCH (IMR)
NATIONAL INSTITUTES OF HEALTH (NIH)
NO 1, JALAN SETIA MURNI U13/52, SEKSYEN U13, SETIA ALAM, 40170, SHAH ALAM, SELANGOR
Tel: 03-3362 8360 EMAIL: bacteriology@moh.gov.my

IMR/IDRC/BACT/TB/01

TUBERCULOSIS LABORATORY REQUEST FORM

PATIENT'S INFORMATION		
Name:	Age:	DOB: __ /__ /____
Identification card (IC)/ Passport No :	R/N :	Gender: ☐ M ☐ F
Ethnicity: ☐ Malay ☐ Chinese ☐ Indian ☐ Others (please specifiy): _____	Nationality: ☐ Malaysian ☐ Non-Malaysian: _____	
Address:		
Date of admission:	Patient's Occupation:	
Hospital:	Ward/ Clinic:	
Name and stamp of requesting Doctor:	Signature of Dr:	

CLINICAL SUMMARY			
Diagnosis:		Duration of illness:	
Pulmonary TB		**Extrapulmonary TB**	
☐ Fever, duration: _____	☐ Loss of appetite	☐ Headache	☐ TB CNS, *specifiy*
☐ Cough,	☐ Loss of weight	☐ Weakness	☐ TB Skin, *specifiy*
☐ Shortness of breath	☐ Lymphadenopathy	☐ Dizziness	☐ TB Bones & Joints, *specifiy*
☐ Haemoptysis	☐ Others: _____	☐ Altered behaviour	☐ TB GIT, *specifiy*
☐ Night sweats	_____	☐ Myalgia	☐ TB Genitourinary, *specifiy*
☐ Chills & Rigors:	_____	☐ Arthralgia	☐ Others: _____

MEDICAL AND TB HISTORY	
☐ BCG vaccination	☐ Diabetes mellitus
☐ Previous TB infection: Year ( )_____	☐ Hypertension
☐ TB treatment : ongoing / completed / not completed	☐ Chronic kidney disease
☐ AFB Smear: Positive (scanty / 1+/ 2+/3+) x ( )	☐ HIV / IVDU
☐ Mantoux: Positive (mm) / Negative	☐ Autoimmune disease
☐ Contact with TB patient: Yes / No	☐ Malignancy
☐ Healthcare worker	☐ Others
☐ Chest X-ray:	☐ Smoking
☐ Others	

SPECIMEN INFORMATION			**LABORATORY INFORMATION**
Type of specimen:	☐ Sputum ☐ Pulmonary samples: BAL, Tracheal aspirate, Gastric lavage, Pleural fluid, Synovial fluid ☐ Tissue, *specifiy* _____ ☐ Pus, *specifiy* _____ ☐ CSF ☐ Other body fluid: Pericardial fluid, Peritoneal fluid, Ascitic fluid, Urine, Blood	☐ Skin ☐ Stool ☐ Formalin-Fixed Paraffin-Embedded (FFPE) tissue ☐ Others, *specifiy* _____	Date of test performed: __ / __ / ____ Result of test:

PRIMARY IMMUNODEFICIENCY UNIT
Allergy and Immunology Research Centre
Institute for Medical Research, National Institutes of Health
No 1, Jalan Setia Murni U13/52, Seksyen U13 Bandar Setia Alam,
40170 Shah Alam, Selangor.
Telephone: 03-3362 8386/ Fax: 03-3362 7906
imunodefisiensi.primer@gmail.com

Primary Immunodeficiency (PID) Request Form

(Please read the instructions on page 2 before filling in request form)

Appointment date given :_____(please fill in)

1. Personal Details

Name :		
Date of Birth :	**Age :**	**Gender :**
NRIC :	**RN:**	
Clinic/Ward :	**Hospital :**	
Requesting Specialist :		
Requesting Specialist's Contact Number :		

2. Clinical History (*Summary of events that suggest PID etiology. Please attach a detailed patient's clinical summary if the space below is insufficient)*

3. Family Pedigree *(3 generations or more)*

4. Investigation required (please tick):

A. Preliminary assessment of immune parameters	
Lymphocyte Subset Enumeration (TBNK)	
B. Functional assay for chronic granulomatous disease *Case must be discussed with PID unit Officer	
Dihydrorhodamine test (DHR)	
C. Other test (please specify: _____) *Case must be discussed with PID unit Officer	

Requesting doctor's full name and signature: _____

Specialist in charge's signature: _____

Blood taken at Time: _____ Date: _____ Ext No: _____

} **MANDA**

PRIMARY IMMUNODEFICIENCY UNIT
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Institute for Medical Research, National Institutes of Health
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40170 Shah Alam, Selangor.
Telephone: 03-3362 8386/ Fax: 03-3362 7906
imunodefisiensi.primer@gmail.com

Instruction

1. All laboratory tests are performed on appointment basis on every working Mondays-Thursdays. Please call our unit at 03-33628386 for appointment.
2. Samples must reach *Primary Immunodeficiency (PID) Unit, Allergy and Immunology Research Centre* before 1 pm on appointment date. Please call to inform if there is any delay/cancellation. Please liaise with your local laboratory to ensure proper arrangement for sample delivery.
3. Please fill in all sections in the request form.
4. Samples **must not** be transported in ice.
5. Please follow the requirement below for each test requested. Take note of the more stringent requirement for test B below:

A. Preliminary assessment of immune function

Investigation (Method used)	Specimen container	Sample volume	Details
Lymphocyte subset enumeration (TBNK) (Flow cytometry)	EDTA	2 ml fresh blood	*Measurement of :* 1. *Total T cells (CD3)* 2. *T helper cells (CD4)* 3. *Cytotoxic T cells (CD8)* 4. *B cells (CD19)* 5. *Natural Killer cells*

B. Functional assay for chronic granulomatous disease
(This test is for cases highly suspicious of chronic granulomatous disease. Please discuss with PID officer)

Investigation (Method used)	Specimen container	Sample volume	Details
Dihydrorhodamine test [DHR] (Flow cytometry)	Lithium Heparin	2ml fresh blood from patient and 2 ml from unrelated healthy person (regardless of age and gender) #please also send 1 ml of patient's blood in EDTA if this test is requested separately from Lymphocyte subset enumeration (TBNK) test.	Assessment of neutrophils respiratory burst

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NO 1, JALAN SETIA MURNI U13/52, SEKSYEN U13, SETIA ALAM, 40170, SHAH ALAM, SELANGOR
Tel: 03-3362 8358
EMAIL: bacteriology@moh.gov.my

IMR/BACT/FORMS/RICK/02

RICKETTSIOSIS LABORATORY REQUEST FORM

PATIENT'S INFORMATION			
Name:		Age:	DOB: __/__/____
Identification card (IC) / Passport No:	R/N:	Gender: ☐ M ☐ F	
Ethnicity: ☐ Malay ☐ Chinese ☐ Indian ☐ Others (*please specify*): _____	Nationality: ☐ Malaysian ☐ Non-Malaysian _____		
Address:			
Date of admission:	Patient's Occupation:		
Hospital:	Ward/ Clinic:		
Name and stamp of requesting Doctor:	Signature of Dr:		

CLINICAL SUMMARY		
Diagnosis:		Date of diagnosis:
Duration of illness:_____days **(Note: Rickettsia PCR valid for duration of illness equal or less than 7 days ONLY)**		
Signs & Symptoms:		
☐ Fever:	☐ Malaise	☐ Dizziness
☐ Eschar:	☐ Headache	☐ Photophobia
☐ Rashes ☐ Maculopapular ☐ Vesicular ☐ Petechial ☐ Others: _____	☐ Nausea	☐ Lymphadenopathy
	☐ Vomiting	☐ Others (*please specify*):

PAST HISTORY
☐ Exposure to rodents (rats and mice) and their fleas
☐ History of tick / mite bites
☐ History of jungle trekking
☐ Occupational exposure to rodents, tick / mite bites (*please specify*):

SPECIMEN INFORMATION		**LABORATORY INFORMATION**
Type of specimen:	☐ Rickettsia Indirect Immunoperoxidase (IIP) serology: Serum sample ☐ Rickettsia PCR : Blood in EDTA tube/ eschar/ tissue/ skin biopsy	Date of specimen received: __/__/ ____ Date of test performed: _/ __/ _____ Result of test:
Date of specimen collection:		

TRANSPLANTATION IMMUNOLOGY UNIT
ALLERGY AND IMMUNOLOGY RESEARCH CENTRE
INSTITUTE FOR MEDICAL RESEARCH
NATIONAL INSTITUTES OF HEALTH
NO 1, JALAN SETIA MURNI U13/52
SEKSYEN U13 BANDAR SETIA ALAM
40170 SHAH ALAM, SELANGOR

DIRECT LINE: 03-3362 8382 TEL: 03-3362 7900 FAX: 03-3362 7906

HLA CROSSMATCH TEST REQUEST FORM (LIVING DONOR)

HOSPITAL : TEL. NO. :
WARD : FAX NO. :
PAYING FREE

	RECIPIENT	DONOR
Name:		
I.C. No. / Passport No.:		
Age / Gender / Ethnic:		
Relationship to Recipient:	- N/A -	
Planned Date of Transplant (*If available*):		

Clinical History

Primary cause of ESRD / CKD	Diabetes	Hypertension	SLE	IgAN	FSGS
	Kidney stone	Others (*Please specify*):			
		Last Treatment Date		Last Treatment Date	
Treatment Given	ATG	:	DFPP	:	
	Rituximab	:	IVIG	:	

Test Method (*Please select*)	RECIPIENT	DONOR
Complement-Dependent Cytotoxicity (CDC-XM)	6 mL blood (Plain tube)	18 mL blood (Sodium Heparin tube)
Flow Cytometry (FC-XM)	6 mL blood (Plain tube)	18 mL blood (Sodium Heparin tube)

Time blood collected:
Date blood collected:

Test requested by:

Signature :
Name :
Stamp :

Date :

1. This test is done **ONLY by appointment from Monday to Thursday.**
2. Please seal the tube stopper to avoid leakage of blood during transportation.
3. Transport condition: Room Temperature (**WITHOUT ICE**).
4. Blood samples must reach the lab by 10.30 am.

For IMR Laboratory Use Only

Received Stamp:

	Recipient	Donor
Lab. No.		
Family No.		
Volume / Quantity		
Sample Condition	Good Others:	Good Others:

Received By:

Note: ***The full name, stamp and signature of the Medical Officer requesting the test MUST be provided. The date and test requested MUST be provided.***

TRANSPLANTATION IMMUNOLOGY UNIT
ALLERGY AND IMMUNOLOGY RESEARCH CENTRE
INSTITUTE FOR MEDICAL RESEARCH
JALAN PAHANG, 50588 KUALA LUMPUR
DIRECT LINE: 03-2616 2581 TEL: 03-2616 2666 FAX: 03-2691 2019

HLA CROSSMATCH TEST REQUEST FORM (DECEASED DONOR)

HOSPITAL : WARD :

	DONOR	RECIPIENT 1	RECIPIENT 2	RECIPIENT 3	RECIPIENT 4
Name:					
I.C. No. / Passport No.:					
Age / Gender / Ethnic:					
Referred Hospital:					

Time blood collected:

Date blood collected:

Test requested by:

Signature :

Name :

Stamp :

Date :

1. Please collect **9 mL x 16 tubes of blood** in **Sodium Heparin tube from donor** and mix well.
2. Please collect a minimum of **6 mL of blood in plain tube from potential recipient.**
3. Please seal the tube stopper to avoid leakage of blood during transportation.
4. Transport condition: Room Temperature (**WITHOUT ICE**).

For IMR Laboratory Use Only

Received Stamp:		DONOR	RECIPIENT 1	RECIPIENT 2	RECIPIENT 3	RECIPIENT 4
	Lab. No.					
	DNA No.					
	Volume / Quantity					
	Sample Condition	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:
	PRA Status (*Past 3 months only*)	- N/A -	☐ Done ☐ Not done Date: Class I : % Class II : %	☐ Done ☐ Not done Date: Class I : % Class II : %	☐ Done ☐ Not done Date: Class I : % Class II : %	☐ Done ☐ Not done Date: Class I : % Class II : %
Received By:						

Note: ***The full name, stamp and signature of the Medical Officer requesting the test MUST be provided. The date and test requested MUST be provided.***

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SEKSYEN U13 BANDAR SETIA ALAM
40170 SHAH ALAM, SELANGOR

DIRECT LINE: 03-3362 8383 TEL: 03-3362 7900 FAX: 03-3362 7906

HLA TYPING TEST REQUEST FORM (DISEASE ASSOCIATION)

☐ **B*27** ☐ **B*15:02**

☐ **B*57:01** ☐ **Others (** **)**

HOSPITAL :
WARD :

TEL. NO. :
FAX NO. :
☐ PAYING ☐ FREE

Patient's Details

Name :
I.C. No. / Passport No. :
Age / Gender / Ethnic :
Diagnosis :

1. This test is done **ONLY by appointment**.
2. Please collect **6 mL of EDTA blood** and mix well.
3. Please seal the tube stopper to avoid leakage of blood during transportation.
4. Transport condition: Room Temperature (**WITHOUT ICE**).
5. Blood samples must reach the lab by 10.30 am.

Time blood collected:
Date blood collected:

Test requested by:

Signature :
Name :
Stamp :

Date :

For IMR Laboratory Use Only

Received Stamp:

	Patient
Lab. No.	
DNA No.	
Family No.	
Volume / Quantity	
Sample Condition	☐ Good ☐ Others:

Received By:

Note: ***The full name, stamp and signature of the Medical Officer requesting the test MUST be provided. The date and test requested MUST be provided.***

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SEKSYEN U13 BANDAR SETIA ALAM
40170 SHAH ALAM, SELANGOR

DIRECT LINE: 03-3362 8383 TEL: 03-3362 7900 FAX: 03-3362 7906

HLA ANTIBODY TEST REQUEST FORM (PRA/DSA)

HOSPITAL : TEL. NO. :
WARD : FAX NO. :
☐ PAYING ☐ FREE

Patient's Details

Name :
I.C. No. / Passport No. :
Age / Gender / Ethnic :

For Solid Organ Transplant Only (MUST BE FILLED IN)

1. CLINICAL HISTORY
Primary cause of ESRD / CKD ☐ Diabetes ☐ Hypertension ☐ SLE ☐ IgAN ☐ FSGS
☐ Kidney stone ☐ Others (*Please specify*):

2. STATUS OF TRANSPLANT
☐ PRE-TRANSPLANT ☐ POST-TRANSPLANT
☐ Deceased Donor Waiting List Donor's Name :
☐ Living-related (Donor's name): Donor's Family No. :
Planned Date of Transplant: *(If available)* Date of Transplant :

For Solid Organ Transplant and HSCT (Where Applicable)

3. SENSITIZING EVENTS
☐ Last Blood Transfusion Date : (*dd/mm/yyyy*)
☐ Pregnancy / Miscarriage No. of Pregnancy :
Last Delivery Date : (*mm/yyyy*)
☐ Previous Transplant Date of Transplant : (*mm/yyyy*)
Donor's Name :
Donor's Family No. :

4. TREATMENT GIVEN

	Last Treatment Date		Last Treatment Date
☐ ATG	:	☐ DFPP	:
☐ Rituximab	:	☐ IVIg	:

1. Please collect **6 mL of whole blood** in plain tube.0
2. Please seal the tube stopper to avoid leakage of blood during transportation.
3. Transport condition: Room Temperature (**WITHOUT ICE**).
4. Blood samples must reach the lab by 10.30 am.

Time blood collected:
Date blood collected:

For IMR Laboratory Use Only

Received Stamp:

	Patient
Lab. No.	
DNA No.	
Volume / Quantity	
Sample Condition	☐ Good ☐ Others:

Received By:

Test requested by:

Signature :
Name :
Stamp :

Date :

Note: ***The full name, stamp and signature of Specialist/ Consultant requesting the test MUST be provided. The date and test requested MUST be provided***

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40170 SHAH ALAM, SELANGOR

DIRECT LINE: 03-3362 8383 TEL: 03-3362 7900 FAX: 03-3362 7906

FAMILY NO :

HLA TYPING TEST REQUEST FORM

HOSPITAL :
TEL.NO :
DIAGNOSIS :
WARD :
FAX NO :
☐ PAYING ☐ FREE

Specific test name :
1) Solid Organ
☐ New case (Loci A, B, C, DR and DQ)
☐ Add donor for existing case (Loci A, B, C, DR and DQ)
2) HSCT
☐ New case (Loci A, B and DR)
☐ Add donor for existing case (Loci A, B and DR)
☐ Confirmatory Typing (CT) (Loci A, B, C, DR and DQ)
☐ Cord blood/ MSCR search (Loci A, B and DR)
3) Specific Loci
☐ Class I (Loci A, B and C) ☐ Class II (Loci DR and DQ)

	RECIPIENT	DONOR 1	DONOR 2	DONOR 3	DONOR 4
Name:					
I.C. No. / Passport No.:					
Age / Gender / Ethnic:					
Last Transfusion Date:		- N/A -	- N/A -	- N/A -	- N/A -
Relationship to Recipient:	- N/A -				

1. This test is done **ONLY by appointment**.
2. Please collect **6 ml of EDTA blood** from each patient and donor(s).
   IMPORTANT NOTE:
   # If TWBC less than 1.5 x 10^3/ml, please collect 15 ml of EDTA blood.
   # If patient has received blood transfusion in the past 3 weeks, please collect samples using saliva kit.
3. Please seal the tube stopper to avoid leakage of blood during transportation.
4. Transport condition: Room Temperature (**WITHOUT ICE**).
5. The blood samples must reach the lab by **10.30 am.**

Time blood collected:
Date blood collected:

Test requested by:
Signature :
Name :
Stamp :
Date :

Note: ***The full name, stamp and signature of the Medical Officer requesting the test MUST be provided.***
The date and test requested MUST be provided.

IMR/AIRC/TI/RF-2 Version 2.1 Issue Date: 31/03/2021 Approved by Head of Unit

TRANSPLANTATION IMMUNOLOGY UNIT
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INSTITUTE FOR MEDICAL RESEARCH
NATIONAL INSTITUTES OF HEALTH
NO 1, JALAN SETIA MURNI U13/52
SEKSYEN U13 BANDAR SETIA ALAM
40170 SHAH ALAM, SELANGOR

DIRECT LINE: 03-3362 8383 TEL: 03-3362 7900 FAX: 03-3362 7906

For IMR Laboratory Use Only

Received Stamp :		RECIPIENT	DONOR 1	DONOR 2	DONOR 3	DONOR 4
	Lab.No.					
	DNA No.					
	Volume / Quantity					
Received By :	Sample Condition	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:	☐ Good ☐ Others:

Note: ***The full name, stamp and signature of the Medical Officer requesting the test MUST be provided.***
The date and test requested MUST be provided.

IMR/AIRC/TI/RF-2 Version 2.1 Issue Date: 31/03/2021 Approved by Head of Unit

MKAK-BPU-D02(rev_Nov_2015)

MAKMAL KESIHATAN AWAM KEBANGSAAN, KEMENTERIAN KESIHATAN MALAYSIA

Lot 1853, Kg Melayu Sungai Buloh, 47000 Sungai Buloh, Selangor Darul Ehsan

Tel: 03-61565109 Fax: 03-61402249/61569654

LABORATORY REQUEST FORM FOR DENGUE AND FLAVIVIRUS

Lab No. *(for lab use)* :	

REQUESTOR INFORMATION

Name :
Post :
Address :
District : State :
Tel. No. : Fax No. : Email :

Purpose of Sampling

a. Dengue (please tick purpose of sampling as below)
- ☐ Outbreak
- ☐ Surveillance
- ☐ Diagnostic

b. Flavivirus (please tick purpose of sampling as below)
- ☐ Outbreak
- ☐ Surveillance
- ☐ Diagnostic

Specimen Category : ☐ **case** Contact ☐

A. PATIENT'S INFORMATION

Name : Age : Date of birth
Sex : ☐ Male ☐ Female
IC No.
Reference No. : Nationality : ☐ Malaysian ☐ Non Malaysian
Address (Please state country of origin)_____
Postcode : Occupation :
District : State : Tel. No. :

B. CLINICAL SUMMARY

- ☐ Fever : T .....°C
- ☐ Retro-orbital pain
- ☐ Maculopapular rash
- ☐ Vomitting
- ☐ Myalgia/arthralgia
- ☐ Diarrhea
- ☐ Bleeding tendencies
- ☐ Hepatomegaly
- ☐ Shock
- ☐ CNS Complications

Date of fever onset : _____(dd/mm/yyyy)

Laboratory findings at admission

Hb : TWBC : (PN : %; L: %; M : %; E: %)
Platelets : /mm^3 HCT :
Dengue NS1 : Date of test :
Method :
Dengue IgG : Date of test :
Method :
Dengue IgM : Date of test :
Method :

Clinical/Provisional Diagnosis :
- ☐ Dengue Fever
- ☐ Dengue Shock Syndrome
- ☐ Compensated Shock
- ☐ Dengue Hemorrhagic
- ☐ Death : _____(dd/mm/yyyy)
- ☐ Other (flavivirus).

C. PATIENT'S LOCATION

☐ Clinic ☐ Ward ☐ ICU

D. SPECIMEN INFORMATION

Type of specimen :	Name of Collector :
Date of Collection: (dd/mm/yyyy)	Date specimen Received (for lab use) : (dd/mm/yyyy)

E. RESULTS (*for lab use only*)

Verified by :	Date:

MAKMAL KESIHATAN AWAM KEBANGSAAN

BORANG PERMOHONAN UJIAN MAKMAL HFMD

No. Rujukan Makmal: **MKAK/ENT/20____/_____)**

A. TUJUAN PERSAMPELAN	
Wabak	O
Survelan (Klinik Sentinel)	O
Kes Teruk (Masuk Wad & Umur < 5 tahun)	O

B. MAKLUMAT PESAKIT	
Nama Pesakit:	
No. Kad Pengenalan / Passport:	Umur:
Warganegara:	Jantina: L / P
Hospital / Klinik Kesihatan:	Wad:
R/N:	Bangsa :
Negeri:	Daerah :

C. MAKLUMAT KLINIKAL		
Gejala	**Tandakan (√) di ruangan berkenaan**	**Tarikh mula**
Demam ≥ 38°C		
Ulser di mulut & tekak		
Maculopapular rash dan / vesikel pada tapak tangan dan tapak kaki		
Tanda dan gejala URTI		
Lain-lain		

D. MAKLUMAT SPESIMEN KLINIKAL				
Jenis Spesimen	**Tandakan (√) di ruangan berkenaan**	**Tarikh diambil**	**Tarikh dihantar**	**Pengambil Sampel**
Rectal swab				
Mouth ulcer				
Vesicle swab				
Stool				

E. MAKLUMAT PEMOHON	**F. MAKLUMAT MAKMAL TRANSIT* (sekiranya berkenaan)**
Tandatangan & Cop Pegawai:	Tandatangan & Cop Pegawai:
No. Telefon:	No. Telefon:

G. UNTUK KEGUNAAN MAKMAL	
Kaunter Penerimaan Sampel	**Makmal**
Tarikh spesimen diterima:	Tarikh spesimen diterima:
Suhu: °C	Suhu: °C
Jenis spesimen:	Jenis spesimen:
Status: Sampel Diterima / Sampel Ditolak*	Status: Sampel Diterima / Sampel Ditolak*
* Sekiranya spesimen ditolak, sila nyatakan sebab: ……	
CATATAN:	
Tandatangan & Cop Pegawai:	Tandatangan & Cop Pegawai:

Sebarang kemusykilan sila hubungi:

- *Makmal Kesihatan Awam Kebangsaan (MKAK) Sungai Buloh, Selangor (u.p. Makmal Isolasi Virus): 03-6126 1200 / 1325*
- *Sample swab mesti dimasukkan dlm vtm dan suhu penghantaran utk semua sample adalah 2-8 degree celcius*

1

MSLF:01/2004

No. Rujukan Makmal	

MEASLES – BORANG PERMOHONAN DAN KEPUTUSAN UJIAN MAKMAL

A. MAKLUMAT PESAKIT		
Negeri:	Daerah:	
Hospital / Klinik Kesihatan:		
Nama Pesakit:		
No. K/P:	Umur:	Jantina: L / P

B. MAKLUMAT IMUNISASI MEASLES	
Imunisasi measles: ☐ Ada ☐ Tiada ☐ Tidak diketahui	Tarikh dos terakhir diberi:

C. MAKLUMAT KLINIKAL		
Gejala (Simptom)	***Ada / Tiada (Tandakan √ diruang berkenaan)***	***Tarikh mula***
Demam		
Ruam (maculopapular rash)		
Konjunktivitis		
Batuk		
"Coryza"		

D. SPESIMEN KLINIKAL			
Spesimen: ☐ Pertama ☐ Kedua			
Spesimen (tandakan √ diruang berkenaan)		***Tarikh diambil***	***Tarikh penghantaran***
Darah / Serum		/ /	/ /
Sekresi pernafasan (Respiratory secretion)		/ /	/ /
Air kencing (Urine)		/ /	/ /

E. MAKLUMAT PEMOHON	
Nama dan Cop Pegawai: Tandatangan:	No telefon: No. fax: e-mail:

F. MAKMAL (Untuk Kegunaan Makmal)			
Keadaan spesimen:			Tarikh terima spesimen:
Spesimen	***Jenis ujian***	***Keputusan ujian***	***Komen***
Darah / Serum			
Sekresi pernafasan (Respiratory secretion)			
Air kencing (Urine)			
Nama dan tandatangan Pegawai Makmal:			
Jawatan Pegawai Makmal dan Cop Makmal:			Tarikh:

* Nota: Jika spesimen ini adalah spesimen kedua, maklumat mengenai Imunisasi Measles dan Klinikal tidak perlu diisi jika telah diisi pada borang spesimen pertama.

Spesimen klinikal (darah / sekresi pernafasan / air kencing) hendaklah diambil jika pesakit disyakki sebagai kes measles.
Defini kes (case definition) adalah seperti dinyatakan di belakang.

Measles Elimination In Malaysia – Measles Surveillance Manual (1st edition)

TBIS 20C
Sistem Maklumat TB,KKM

Kementerian Kesihatan Malaysia
Program Kawalan Penyakit TB
Permohonan ujian TB

A. Pusat Pungutan spesimen (Wad/KK/Hospital) : **Tarikh Permohonan:**

B. Maklumat Pesakit

Nama :		No Pengenalan Diri (IC/Paspot) :
Umur :	No Telefon :	Jantina: ☐ M ☐ F
Alamat:		Warganegara : ☐ Malaysia ☐ Bukan Malaysia, Nyatakan .....
Status *RVD* : ☐Positif ☐Negatif		☐Diabetik? : ☐Ya ☐Tidak

C. Sebab memohon (Tandakan satu)

☐*Presumptive TB* ----------→

☐*Follow-up TB case (Month of treatment: ……..months)*

☐*Contact of TB case*

☐*Contact of DRTB case (RR, MDR, XDR, TDR)*

☐*Suspected MDR-TB*

☐ *Surveillance* of ……

Adakah pesakit telah menerima rawatan ≥ 1 bulan?

☐ Ya ☐ Tidak (New Case)

Sekiranya YA,

No Pendaftaran TB bagi kes adalah: ☐☐-☐☐-☐☐☐☐

Klasifikasi *Previously Treated TB* adalah :

☐After Failure of 1st treatment ☐After Failure of retreatment

☐After loss to follow-up ☐Relapse ☐Others

D. Jenis Specimen : ☐ Kahak (x1 / x2 / x3) ☐ Spot ☐ Pagi ☐ lain-lain (nyatakan) : ……

Tarikh pengambilan spesimen : ☐☐-☐☐-☐☐☐☐ ……..

E. Ujian Di pohon

☐Microskopik ☐Kultur ☐ID & Kerentanan Ubatan (Drug susceptibility)

☐PCR MTB ☐Xpert MTB/RIF ☐LPA ☐Interferon Gamma Release Assay (IGRA)

F. Maklumat Pemohon

Tandatangan :

Nama :

Jawatan & Cop Rasmi :

No.Telefon :

KEPUTUSAN UJIAN MAKMAL (Di isi oleh pihak makmal yang menjalankan ujian)

(Sila gunakan bahagian belakang mukasurat ini sekiranya ruangan tidak mencukupi)

Diuji oleh:	**Disahkan oleh**
Tandatangan:	Tandatangan:
Nama:	Nama:
Jawatan & Cop Rasmi:	Jawatan & Cop Rasmi:
No.Telefon:	No.Telefon:

Lampiran 2

MAKMAL KESIHATAN AWAM IPOH
KEMENTERIAN KESIHATAN MALAYSIA
Tel : 05 - 528 7829 Fax : 05 - 528 7836

Document No.	MKAI/SP/MOL/WS-04
Issue/ Revision No.	1/0
Effective Date	10 June 2019

VIRAL ENCEPHALITIS / MENINGITIS INVESTIGATION REQUEST FORM

PURPOSE OF SAMPLING	**SPECIMEN CATEGORY**
☐ Diagnostic ☐ Outbreak / Cluster	☐ Case ☐ Contact

PATIENT INFORMATION

Name		Age	
I/C No.		Gender	Male / Female
R/N No.		Occupation	
Ward		Nationality	Malaysian / Non-Malaysian (_____)

EPIDEMIOLOGY INFORMATION

Travelling History		**Place of Occurance** (Please state it e.g. school/ household/ public places)
Country	Date Visit	

Exposure History			**Recreational Activities**	
Type of animal/ arthropod		Date of Exposure	☐ Camping	☐ Swimming
Animal			☐ Hunting	☐ Others (_____)
Arthropod				

Immunization Status

☐ Complete	☐ Incomplete	Other Vaccination Taken:	Date of Last Dose:

CLINICAL SUMMARY

Date Onset of Fever: _____	☐ Altered mental status	☐ Nausea	☐ Seizures
	☐ Irritability	☐ Patient Expired	☐ Stiff Neck
☐ Fever (T____°C)	☐ Loss of Consciousness	☐ Photophobia	☐ Sudden severe dementia
☐ Headache	☐ Muscle Weakness	☐ Rash	☐ Vomiting

Clinical/ Provisional Diagnosis:

LABORATORY FINDINGS AT ADMISSION

Hb	TWBC	%PN	%L	%N	%M	%E	Platelets	HCT

CEREBROSPINAL FLUID (CSF) ANALYSIS RESULT

Pressure : Normal / High Appearance : Clear / Turbid Protein : Normal / High

Glucose : Normal / Low Cell Count : _____ /ul lymphocytes (Normal Range : <5/ul)

SPECIMEN INFORMATION

Specimen Type : ☐ CSF ☐ Serum ☐ Throat Swab ☐ Urine ☐ Saliva ☐ Others :

Date & Time Specimen Collection: @

REQUESTOR INFORMATION

Name		Emel Address	
Designation		Hosp. / PKD	
Sign & Cop		Tel & Fax No.	

FOR LABORATORY USE ONLY

Specimen received by :	Date & Time specimen received:

Lampiran-3

MOLECULAR LABORATORY PATHOLOGY DEPARTMENT HOSPITAL RAJA PERMAISURI BAINUN 30990 IPOH, PERAK	FOR LAB USE LAB NO:

LAB REQUEST FORM FOR MERS-CoV INVESTIGATIONS

HOSPITAL/CLINIC:	WARD :
1. Name :	2. R/N :
3.NRIC/Passport No :	4. Gender: ☐ Male ☐ Female
5. Age : / 6. Race :	7. Occupation :
8. Country of Origin:	9. Marital Status :

10. Clinical Findings :

Symptoms : Date of onset: (dd / mm / yy)

- ☐ Cough (/ /)
- ☐ Shortness of breath (/ /)
- ☐ Difficulty in breathing (/ /)
- ☐ Hypoxia (/ /)
- ☐ Fever (/ /)
- ☐ Runny nose (/ /)
- ☐ Acute respiratory distress syndrome (/ /)

Travel History: YES ☐ NO ☐
If yes, please state the country(s)/ province:

Date of visit: (/ /) to (/ /)

Contact with confirmed novel coronavirus infected: YES ☐ NO ☐

Relation: _____

Vital Signs :

Blood pressure: ...../.... mmHg Pulse rate: ...../min

Temperature: .....°C SpO_2: .....%

Respiratory rate: ...../min

Lungs : .....

Investigation:

WBC: ..... Platelet: .....

Chest x-ray : .....

11. Type of specimen :

- ☐ Throat gargle
- ☐ Throat swab
- ☐ Nasopharyngeal Asp/ wash
- ☐ Nasal swab
- ☐ Sputum
- ☐ Blood
- ☐ Serum
- ☐ Urine
- ☐ Faeces
- ☐ Others: .....

Doctor's Name :

.....

Contact No :

.....

Signature :

.....

For Lab Use

Results:

PS 1/98 (Pindaan 2007)

KEMENTERIAN KESIHATAN MALAYSIA
PERKHIDMATAN PATOLOGI

BORANG PERMOHONAN PAP SMEAR
PAP SMEAR REQUEST FORM

No. Sitologi:

Hospital / Klinik *Hospital / Clinic*	

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*

i. **Tarikh sampel diambil:** *Date sample taken* ☐☐ ☐☐ ☐☐

ii. **Jenis Sampel:** *Type of sample*
- ☐ Conventional Pap Smear
- ☐ Liquid-based preparation

iii. **Bahagian sampel diambil:** *Sample site*
- ☐ Serviks / *cervix*
- ☐ Vagina / *Vagina*

iv. **Jenis saringan:** *Type of screening*
- ☐ Pertama / *new*
- ☐ Ulangan / *repeat*

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*
- ☐ Hamil / *Pregnant*
- ☐ Postpartum / *Postpartum*
- ☐ Pra-menopos / *Pre menopausal*
- ☐ Pos-menopos / *Menopausal*

ii. **Tarikh Haid terakhir:** *Last menstrual period* ☐☐ ☐☐ ☐☐

iii. **Kontraseptif / Terapi hormon:** *Contraceptive / hormonal therapy:*
- ☐ ADR / *IUCD*
- ☐ Hormon / *Hormone*
  Nyatakan / *Specify* : .....
- ☐ Tiada / *None*

iv. **Sejarah Rawatan** *Treatment History*
- ☐ Kemoterapi / *Chemotherapy*
- ☐ Radiasi di bahagian pelvik / *Pelvic radiation*
  Nyatakan tarikh akhir rawatan :
  Specify completion date : .....
- ☐ Pembedahan ginekologi / *Gynaecology surgery*
  Nyatakan / *Specify* : .....
  .....
- ☐ Tiada / *None*

v. **Gejala / Tanda:** *Symptom / Sign*
- ☐ Tiada / *Nil*
- ☐ Lelehan dari faraj / *Vaginal discharge*
- ☐ Pendarahan luar biasa / *Abnormal bleeding*

  Nyatakan / *specify* .....
  .....

vi. **Serviks :** *Cervix*
- ☐ Biasa / *Normal*
- ☐ Luar Biasa / *Abnormal*
- ☐ Tiada serviks / *Absent Cervix*

vii. **Maklumat tambahan:** *Additional information* .....
.....
.....
.....
.....
.....
.....

MAKLUMAT PEMOHON / *REQUESTING PRACTITIONER*

Nama : *Name*

Jawatan / COP: *Designation / Stamp*

Tandatangan : *Signature*

MAKMAL GENETIK
JABATAN PATOLOGI
HOSPITAL TUNKU AZIZAH
Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.
Telefon: 03-2600 3000 Sambungan: 1134 (Molekular)
Email: makmalgenetik@gmail.com

HTA/PATH.GEN/02-2021

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:	**KETURUNAN** ETHNICITY	**JANTINA** SEX
WAD/HOSPITAL WARD/HOSPITAL	**TARIKH PENGAMBILAN SAMPEL** SAMPLE COLLECTION DATE	
TUJUAN RUJUKAN/REFERRAL REASON □Diagnostic Test □Carrier Screening: Affected family member:.....	□DNA Extraction & Storage □Others:	
JENIS SPESIMEN/ SPECIMEN TYPE □Whole Blood □Saliva	□Tissue: Block/Slides No: ..... □Others:	
RINGKASAN KLINIKAL CLINICAL HISTORY	Smoker: Yes/No/Ex-smoker Smoking duration: .....years	
MAKLUMAT KELUARGA RELEVANT FAMILY HISTORY		
DIAGNOSIS KLINIKAL CLINICAL DIAGNOSIS		
STATUS PENYAKIT DISEASE STATUS	□New Diagnosis □Remission □Relapse □Others :	
KEPUTUSAN MAKMAL LAB INVESTIGATIONS	Previous genetic tests/HPE :	

PERMOHONAN UJIAN/TEST REQUEST:

PENYAKIT KONGENITAL CONGENITAL DISORDERS	**GENETIK KANSER** CANCER GENETICS	
	Single Gene Testing	**Targeted Gene Panel**
□ DMD/BMD □ Rett Syndrome □ Muenke Syndrome □ Beckwith-Wiedemann Syndrome □ Russell-Silver Syndrome □ Y-Microdeletion □ Others:	□ *EGFR* □ *ALK* □ *ROS1* □ *KRAS* Treatment: □1st gen TKI □2nd gen TKI □3rd gen TKI □ 1p19q deletion □ IDH1/IDH2 □ Others:	□ Lung Cancer □ Breast/Ovarian Cancer □ Colorectal Cancer □ Others: .....

Tandatangan dan Cop Rasmi Pakar/Pakar Perunding:

Tarikh:
No Telefon:
Email:

No. Makmal:

PER-SS-BT 105
(Pind. 1/2016)

BORANG PERMOHONAN TRANSFUSI DARAH
PERKHIDMATAN TRANSFUSI PERUBATAN

(Mesti dipenuhi dalam dua salinan. Tulis dengan pen mata bulat dan sila tandakan √ dalam petak yang berkenaan.)

Nama (Tulis huruf besar)			No. Kad Pengenalan		No. Daftar
Hospital	Unit	Wad	Bangsa	Umur	Jantina
Pegawai Kerajaan Ya/Tidak	Kelas	Bayar/Percuma	Pakar Perunding		Kumpulan Darah Ada/Tiada
Diagnosa		Sebab transfusi komponen darah		Hb % atau keputusan lain yg berkaitan (Plt count etc)	
Transfusi darah masa lalu? Ya/Tidak	Jika 'ya' sebutkan tarikh transfusi darah yang terakhir			Komplikasi?	
Sekiranya pesakit seorang wanita, nyatakan →	Bil. kehamilan	Bil. Lahir Mati		Tanda-tanda "Haemolytic Disease of Newborn"	

Sampel darah diambil dan dilabel oleh:

Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung* dan memeriksa gelang pengenalan pesakit. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabelkannya dengan serta merta sebaik sahaja ianya diambil.

Tandatangan .....

Nama .....

Jawatan.....

Tarikh.....Waktu.....pg/ptg

* (atau ahli keluarga / penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)

Units/ mls

- ☐ WHOLE BLOOD .....
- ☐ PACKED CELLS .....
- ☐ PAEDIPACK .....
- ☐ PLATELET CONCENTRATE .....
- ☐ CRYOPRECIPITATE .....
- ☐ FRESH FROZEN PLASMA .....
- ☐ CRYOSUPERNATANT.....

SPECIAL REQUIREMENT :

- ☐ WASHED.....
- ☐ FILTERED.....
- ☐ IRRADIATED.....
- ☐ OTHERS : .....
- ☐ GROUP, SCREEN & HOLD

Nota:-

(1) Sila hantarkan 3ml-5ml sampel darah dalam tub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam.

(2) Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakserasian yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat.

(3) Darah yang tidak digunakan perlu dipulangkan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad.

(4) **AMARAN: Setiap transfusi darah membawa risiko infeksi.**

WARNING: Every blood transfusion carries a small risk of infection.

Bekalan diperlukan

(a) Serta merta, tanpa ujian keserasian darah (sate O) (untuk menyelamatkan nyawa) ☐

(b) Segera (lihat Nota 2) ☐

(c) Pada .....jam.....pg/ptg (Lihat Nota 3) ☐

(d) Sampel disimpan selama 24 jam. ☐

Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bernama seperti di atas dan dilabelkan mengikut prosedur kerja yang telah ditetapkan. Saya juga mengesahkan bahawa setelah diperiksa, pesakit ini memerlukan/akan memerlukan transfusi darah.

Tandatangan: .....
Cop dan Nama
Pegawai Perubatan: .....
(Huruf besar)

KHAS UNTUK KEGUNAAN KAKITANGAN MAKMAL TRANSFUSI DARAH

Permintaan diterima	T/Tangan	Anti A	Anti B	Anti AB	Sel A	Sel B	Sel O	Rh D	Kump. Darah	T/Tangan	Tarikh & masa
Tarikh..... Waktu .....pg/ptg											

Serum pesakit diserasikan dengan beg darah no.	UJIAN KESERASIAN DARAH					Catatan
	R.T.	37°C	AHG	T/Tangan.	Tarikh & masa	

PDN/IH/QP-05/01, ver 01
Effective date : 1st January 2021

Permohonan Ujian Immunohematologi

Makmal Rujukan Immunohematologi, Pusat Darah Negara, Jalan Tun Razak, 50400 Kuala Lumpur
No telefon : 03-2613 2688 ext 2672 / 5671 (Red Cell) / 2766 (Platelet & Genotyping)

BAHAGIAN A : Maklumat Pesakit

Nama Pesakit :		Etnik :
No KP / Passport :		Umur :
Jantina :	Hb :	Hospital :
Sejarah transfusi : **Ringkasan klinikal :** *** Kepilkan bersama borang patologi / surat rujukan hospital*		

BAHAGIAN B : Maklumat Pemohon (Tabung Darah Hospital)

Nama doktor / pemohon :	No telefon :	Tandatangan / cop rasmi :

BAHAGIAN C : Maklumat Permohonan Ujian

(Perlu diisi dengan lengkap oleh pemohon bagi membantu pihak IH-PDN menjalankan ujian berkaitan)

Nama MO PDN dihubungi :	Kod MO PDN :	Tarikh / masa permohonan :

Nyatakan maklumat dibawah mengikut jenis ujian dipohon		Ujian penjenisan antibodi sahaja	Ujian Penjenisan Antibodi & bekalan darah	Crossmatch & bekalan darah	Genotype (dengan kebenaran KB/KS IH-PDN sahaja	Family study / lain-lain ujian
Kump. darah ABO/Rh						
Saringan antibodi : • Cell 1 • Cell 2 • Cell 3 • DAT						Sila nyatakan jenis ujian :
Jenis antibodi terdahulu (jika ada)						
Permohonan khas (cth : pedipack / irradiate)						
Bilangan darah diperlukan						
Tarikh diperlukan						
Senarai semak	Jenis/jumlah sampel darah	10ml* & 10ml **	10ml* & 10ml**	5ml*	4ml*	10ml* & 10ml** ***Saliva utk ABO confirmation*** *= supernatant jernih dari 10ml saliva yang telah dididihkan selama 10 minit*
	Borang GXM hospital	Jika perlu	**PERLU**	**PERLU**	Tak berkaitan	

Nota :-
a) * : tiub EDTA, ** : tiub plain tanpa gel, KB: Ketua Bahagian, KS : Ketua Seksyen, IH-PDN : Immunohematologi, Pusat Darah Negara.
b) **HOSPITAL SWASTA** : keputusan ujian hanya akan diberikan setelah pembayaran diselesaikan. Sekiranya pembayaran dilakukan oleh institusi lain, sertakan surat persetujuan pembayaran dari institusi pembayar.
c) Sekiranya terdapat maklumat lanjut berhubung ujian makmal yang telah dijalankan, catatkan ke dalam borang patologi / surat rujukan hospital masing-masing yang perlu disertakan.

PDN/IH/QP-05/02, ver 01
Effective date : 1st January 2021

Platelet Immunology Test Request

Makmal Rujukan Immunohematologi, Pusat Darah Negara, Jalan Tun Razak, 50400 Kuala Lumpur
No telefon : 03-2613 2688 ext 2766 (Platelet & Genotyping), 2672 (Red Cell)

IMPORTANT : Note on Platelet Immunology Test Request

1. All platelet Immunology case must be discussed with specialist (on-call) PDN for approval of referral.
2. Collect fresh sample before delivery. Do not collect and keep. All samples must reach lab within 48 hours. Sample reception is during office hours only.
3. Turnaround time is 15 days. It may exceed upon confirmation test or forward to HPA genotyping test.
4. New case of PXM must be requested with PAb. However, if PAb is neg, PXM may be cancelled. Due to urgency, PXM may be conducted ahead of PAb.
5. For additional PXM request (initial case of less than 2 weeks), please call MO PDN (on-call) to check on sample availability. This form may not be send if sample is still available in the platelet lab, PDN. If new sample required, please send the samples together with this form.
6. **For <u>all PXM</u> request** (new and known case), **<u>please request MO on-call PDN to raise PXM notification form to the lab.</u>** once request approved.

Detail of patient and requesting doctor

Patient's name :		Age :	Ward & Hosp (official stamp) :
ID No :		Gender :	
Platelet count :	Pregnant : ☐ Yes ☐ No	Ethnicity :	Details of medical officer requesting :-

Indication** (See footer note below)

- ☐ NAIT
- ☐ PTR
- ☐ PTP
- ☐ ITP

Diagnosis :

Select test required

- ☐ Platelet antibody identification (PAb)
- ☐ NAIT investigation
- ☐ HPA Genotyping (father) for NAIT risk assessment
- ☐ Platelet Crossmatch (PXM) supply
  - See note above, point # 4-6
  - Name of MO PDN spoken to :

Details of medical officer requesting :-

- Signature :
- Name :
- Official stamp :
- Tel num. :
- Date and time :

Name of specialist (PDN) approving :

Clinical History

Clinical presentation, sign and symptom. Preliminary / working diagnosis. History of medication.			FBP result to rule out pseudo-thrombocytopenia
History of blood product transfusion, platelet count trend. Indication of immune-mediated thrombocytopenia.			
For NAIT case only: History of current delivery – birth history / ICH / IUT / onset of thrombocytopenia			
Family history of previous miscarriage / stillbirth / pre-mature / NAIT delivery and severity / platelet dysfunction			
History of mother in current pregnancy / delivery. Any miscarriage / stillbirth ?	Gravida : Para :	History of antenatal ITP / Autoimmune disease and medication received :	
Availability of father's sample *Note : please ensure that father sample is not lyse for parental crossmatch test*	Sent Name ID No	Not sent Reason :	

**** Whole blood volume. Do not spin / process.*** :

<u>NAIT case</u> (biological parent sample)
- *Mother : 10ml EDTA tube **<u>and</u>** 10ml in plain tube*
- *Father : 10ml EDTA tube*
- *Baby : 1ml in EDTA tube*

<u>PTR and PTP case</u>
<u>Platelet crossmatch</u>
- *10ml in EDTA tube, **<u>and</u>***
- *10ml plain tube*

<u>ITP case</u>
- *10ml plain tube, **<u>and</u>***
- *10ml in EDTA tube (if plt > 20 x 10^9/L)*
- *15 – 20 ml in EDTA (if plt 10 - 20 x 10^9/L)*
- *2ml in EDTA if plt <9 x 10^9/L)*