

**JABATAN PATOLOGI,
HOSPITAL TUANKU FAUZIAH
KANGAR PERLIS.**

**BUKU PANDUAN MAKMAL PATOLOGI
HOSPITAL TUANKU FAUZIAH
HTF/PL/BP-5
EDISI 8
12 JULY 2021**

**DISEDIAKAN OLEH:
BALQISSIAH BT BAHARUDIN
PIC LABORATORY HANDBOOK
JABATAN PATOLOGI**

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GENERAL STATEMENTS

The data in the laboratory handbook are valid only for our clients use. This book contains information about policy of our department, specific policy for each unit in the department, laboratory turn-round-time (LTAT), test offered, suitable specimen etc. The tables presented in the list of tests represent the current information for all test offered by our department. Since revision of test offered is an ongoing process, users should expect revision of this book. Any new updates will be communicated through service agreement, letter, meeting minutes, memorandum etc and will be included in the revised edition. Current edition is posted on hospital website htf.moh.gov.my

Jabatan Patologi, Hospital Tuanku Fauziah has the right to make additions, deletions or modifications to the contents. With this new edition dated 12 July 2021, the old edition (Versi 7, 2019) is obsolete.

Previous Version:

2010, 2012, 2017, 2018, 2019

Overview of Changes

HTF Pathology Laboratory Handbook Version 8, July 2021 replaces the previous version of the book, Version 7, May 2019, published in 2019. The major changes in this new version are listed below. Other minor or editorial changes were made to the general formatting and to some of the table footnotes and comments. Record of amendments and updates can be found in Appendices section ([APPENDIX 12](#)). The records are overview of major additions or changes unless otherwise noted as a “*deletion*.”

ABREVIASI/SINGKATAN

HTF	Hospital Tuanku Fauziah
FBC	Full blood count
IQC	Internal Quality Control
EQA	External Quality Assurance
LTAT	Laboratory turn around time
TDM	Therapeutic drug monitoring
TFT	Thyroid function test
ABG	Arterial blood gas
POCT	Point of Care Testing
HPE	Histopathological Examination
C&S	Culture and sensitivity
HKL	Hospital Kuala Lumpur
HSgB	Hospital Sungai Buloh
HPJ	Hospital Putrajaya
HA	Hospital Ampang
HQE	Hospital Queen Elizabeth
HSB	Hospital Sultanah Bahiyah
HSAH	Hospital Sultan Abdul Halim
HRPZ2	Hospital Raja Perempuan Zainab II
HSJ	Hospital Seberang Jaya
HPP	Hospital Pulau Pinang
HRPB	Hospital Raja Permaisuri Bainun
HTA	Hospital Tunku Azizah (Hospital Wanita dan Kanak-kanak Kuala Lumpur)
HUK	Hospital Ulu Kinta
IMR	Institut Penyelidikan Perubatan
IMR-BAC	Unit Bakteriologi, Institut Penyelidikan Perubatan
IMR-AIRC	Unit Penyelidikan Autoimun, Institut Penyelidikan Perubatan
IMR-PARA	Unit Parasitologi, Institut Penyelidikan Perubatan
IMR-VIRO	Unit Virologi, Institut Penyelidikan Perubatan
IMR-ENDO	Unit Diabetes & Endokrin, Institut Penyelidikan Perubatan
IMR-BIO	Unit Biokimia, Institut Penyelidikan Perubatan
IMR-MD	Unit Molekular Diagnostik, Institut Penyelidikan Perubatan
IMR-TOF	Unit Toksikologi dan Farmakologi, Institut Penyelidikan Perubatan
MKAK	Makmal Kesihatan Awam Kebangsaan
MKAI	Makmal Kesihatan Awam Ipoh
IKN	Institut Kanser Negara
YHM	Yayasan Hepar Malaysia
JKM	Jabatan Kimia Malaysia
UPM	Universiti Putra Malaysia
No KP	Nombor Kad Pengenalan
No AE	Nombor Accident and Emergency
JTMP	Juruteknologi Makmal Perubatan
Dr	Doktor
JT	Jururawat Terlatih
COVID-19	Coronavirus Disease
PPE	Personal Protective Equipment
PK	Unit Patologi Kimia
Hema	Unit Hematologi
Mikro	Unit Mikrobiologi
BB	Unit Transfusi
Histo	Unit Histologi
Sito	Unit Sitologi
Sample/Container	
CSF	Cerebrospinal fluid
BMA	Bone marrow aspirate
NPA	Nasopharyngeal aspirate
NPS	Nasopharyngeal swab

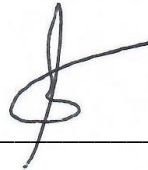
BAL	Bronchoalveolar lavage
OPS	Oropharyngeal swab
TA	Tracheal aspirate
VTM	Viral transport medium

QUALITY POLICY STATEMENT

The Head of Department outlined the quality policy for the laboratory as stated below and this is disseminated to all staff in pathology department as a guidance to all staff to always maintain a high-quality pathology service.

- a. Provide and maintain that pathology service comply with the current MS ISO 15189 requirements.
- b. Ensure that pathology lab provides accurate and timely results that continuously meet and exceeds the stated and implied expectations of our customers to aid them in the management of patients.
- c. Maintain quality and continually improve the pathology service by achieving set performance measurements
- d. Ensure that pathology service is equipped with adequate and appropriate equipment that are functioning well
- e. Ensure that all staffs are provided with knowledge, skill and maintenance of their competency in the form of continuous training and monitoring.
- f. Ensure workplace is safe and secure and staffs maintain their health through health programme
- i. Continually improve the lab quality management system by regular monitoring in the form of internal audits, and external audits.

Authorized by: _____



HEAD OF DEPARTMENT

Department of Pathology
Hospital Tuanku Fauziah, Kangar, Perlis.

**JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH**

VISI

JABATAN PATOLOGI HOSPITAL TUANKU FAUZIAH MENCAPAI STATUS MAKMAL
BERTARAF ANTARABANGSA YANG MAMPU MENYEDIAKAN PERKHIDMATAN
MAKMAL TERBAIK

MISI

MEMBERI PERKHIDMATAN KEPAKARAN YANG BERKUALITI TINGGI DENGAN
MENGHASILKAN KEPUTUSAN YANG TEPAT, BOLEH DIPERCAYAI, DALAM
TEMPOH YANG DIPERSETUJUI DAN DILAKUKAN OLEH PEGAWAI YANG TERLATIH
DAN KOMPETEN

**OBJEKTIF UMUM
JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH**

MEMBERIKAN PERKHIDMATAN BERKUALITI TINGGI BAGI MEMENUHI KEHENDAK PELANGGAN (CUSTOMER SATISFACTION) DENGAN MENGHASILKAN KEPUTUSAN YANG TEPAT, BOLEH DIPERCAYAI DAN DALAM TEMPOH YANG DIPERSETUJUI. MENEKANKAN KEPADA PENINGKATAN PRODUKTIVITI MELALUI KERJA SECARA BERPASUKAN DENGAN PENUH DEDIKASI SERTA MEMBERI PERKHIDMATAN YANG BERKUALITI, EFEKTIF, EFISIEN, DINAMIK DAN BERSESUAIAN DENGAN KEPERLUAN SEMASA.

**OBJEKTIF KHUSUS
JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH**

MEMENUHI DAN MELAKUKAN SEMUA PERMINTAAN UJIAN MAKMAL DALAM
MASA YANG DITETAPKAN.

MENGHASILKAN KEPUTUSAN UJIAN YANG TEPAT DENGAN MENGIKUT
PROSEDUR YANG BETUL.

UNTUK MENYEDIAKAN PERKHIDMATAN BEKALAN DARAH YANG MENCUKUPI
DAN DISARING.

**OBJEKTIF KUALITI
JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH**

LATIHAN

≥ 80% kakitangan Jabatan Patologi menghadiri latihan sekurang-kurangnya (≥) 7 hari setahun.

PRE-ANALITIKAL

Kadar penolakan spesimen Jabatan Patologi ≤ 1%

ASET

≥ 80% peralatan aset jabatan dilakukan 'PPM' dalam tempoh masa yang ditetapkan

METROLOGI DAN KALIBRASI

≥ 80% '*percentage of equipment performance checking activity within the recommended interval*'

ADUAN

≥ 80% maklumbalas aduan diberi secara bersurat kepada pengadu dalam tempoh kurang daripada 14 hari

KESELAMATAN DAN KESIHATAN PEKERJAAN

≥ 80% kewajipan staf Jabatan Patologi menghadiri '*Wellness Clinic*'

CONTINUOUS IMPROVEMENT

≥ 1 Kajian '*Clinical Audit*' untuk jabatan dalam setahun

POST-ANALITIKAL

≥ 80% *turnaround time of tests offered by pathology department meet the standard*

ANALITIKAL

Memperoleh pencapaian lulus sekurang-kurangnya 80% daripada keseluruhan program kawalan mutu eksternal (EQA) yang disertai oleh unit-unit di Jabatan Patologi

QUALITY INDICATOR

≥ 80% indikator kualiti unit-unit dan jabatan mencapai sasaran yang ditetapkan.

JABATAN PATOLOGI HOSPITAL TUANKU FAUZIAH

PIAGAM PELANGGAN

Kami berjanji untuk memberikan perkhidmatan secara profesional, selamat, mesra, penyayang dan berkualiti.

1. Bermula dari tempoh permohonan ujian diterima, keputusan ujian segera 'urgent' akan dikeluarkan seperti berikut:

Unit	Ujian Segera	Tempoh
Patologi Kimia	<i>Renal Profile</i> dan Serum Bilirubin Neonatal (SBV)	1 jam
Hematologi	<i>Full Blood Count</i> (FBC) <i>PT/APTT</i>	45 minit 1 jam
Histopatologi /Sitopatologi	HPE <i>small urgent biopsy</i> FNAC/ <i>Nongynae fluid</i>	3 hari bekerja 3 hari bekerja
Mikrobiologi	CSF gram stain ' <i>Validation of Blood Culture Positive</i> '	1 jam 3 hari
Perubatan Transfusi	Bekalan darah bagi kes ' <i>urgent transfusion</i> '	30 minit

2. Berusaha memastikan bekalan darah adalah mencukupi.
3. Memastikan kerahsiaan semua maklumat berkaitan pendermaan darah.

Perkhidmatan adalah tertakluk kepada pelanggan yang mengikuti peraturan dan prosedur yang ditetapkan pihak Jabatan.

**JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH**

- **SKOP PERKHIDMATAN**

JABATAN PATOLOGI MENAWARKAN UJIAN DIAGNOSTIK DI DALAM BIDANG PATOLOGI KIMIA, HEMATOLOGI, MIKROBIOLOGI, HISTOSITOPATOLOGI DAN PERUBATAN TRANSFUSI SAMADA DILAKUKAN DI MAKMAL JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH ATAUPUN SECARA RUJUKAN KE MAKMAL LUAR MENGIKUT PERJANJIAN.

- **WAKTU PERKHIDMATAN**

Unit	Waktu Perkhidmatan
Patologi Kimia	24 jam
Haematologi	24 jam
Perubatan Transfusi	24 jam
Mikrobiologi	8 pagi - 10 malam
Histositopatologi	Waktu pejabat pada hari bekerja

NOMBOR SAMBUNGAN TELEFON JABATAN PATOLOGI

LOKASI	NOMBOR SAMBUNGAN
Ketua Jabatan	8194
Aduan (PIC)	8188
PENTADBIRAN JABATAN	
Kaunter Patologi	8191
Pejabat Pentadbiran	8193
Juruteknologi Makmal Perubatan U32/U36/U40/U38	8194
Bilik Mikroskop (Pakar/Pegawai Perubatan)	8402
UNIT TRANSFUSI	
Ketua Unit/Pakar Perubatan Transfusi	8210
Kaunter Penderma Darah	8206
Pegawai Perubatan	8199
Pegawai Sains	8202
Makmal Transfusi	8201
Pegawai Seranta	8197
Bilik Derma Darah	8198
UNIT HISTOSITOPATOLOGI	
Ketua Unit/Pakar Anatomi Klinikal	8188/8562
Makmal Histopatologi	8186
Makmal Sitologi (Bilik Diagnostik)	8187
Makmal Sitologi (Bilik Demografik)	8561
UNIT MIKROBIOLOGI	
Ketua Unit/Pakar Klinikal Mikrobiologi	8181/8183
Pegawai Sains (Mikrobiologi) Kanan	8181
Pegawai Sains (Mikrobiologi)	8183
Makmal Mikrobiologi	8182
UNIT PATOLOGI KIMIA	
Ketua Unit/Pakar Patologi Kimia	8196
Pegawai Sains (Patologi Kimia) Kanan	8205
Pegawai Sains (Patologi Kimia)	8204
Makmal Biokimia	8190/8209
Makmal Dadah	8208
UNIT HEMATOLOGI	
Ketua Unit/Pakar Hematologi	8203
Pegawai Sains	8204
Makmal Hematologi	8189

General line : 04-9738000

Panggilan dari luar boleh dibuat terus ke nombor 04-973 diikuti dengan nombor sambungan pegawai yang ingin dihubungi.

POLISI UMUM JABATAN PATOLOGI

1. Permohonan ujian hanya boleh dilakukan oleh Pegawai Perubatan berdaftar (penuh atau sementara) dengan pengecualian pada ujian *Pap Smear*.
2. Semua permohonan ujian perlu menggunakan borang dan bekas spesimen yang telah ditetapkan.
3. Hanya borang permohonan dan label spesimen yang diisi lengkap sahaja akan diterima.
4. Semua spesimen “biohazard” dan berisiko tinggi perlu diuruskan mengikut peraturan yang telah ditetapkan.
5. Permohonan untuk ujian “**SEGERA**” :
 - a. Hanya untuk kes yang memerlukan rawatan segera sahaja.
 - b. Permohonan ini perlu dilabel “**SEGERA**” atau seumpamanya dengan tulisan atau tanda yang jelas.
 - c. Spesimen untuk ujian “**SEGERA**” dan seumpamanya perlu diasingkan daripada permohonan ujian biasa.
 - d. Hanya ujian tertentu sahaja boleh dipohon sebagai segera. Sila rujuk **Senarai Ujian Segera**.
6. Keputusan ujian yang abnormal dan memenuhi kriteria *Critical Value* akan dimaklumkan melalui telefon oleh anggota yang bertugas dan akan disusuli dengan keputusan bertulis.
7. Semua keputusan ujian akan diserahkan kepada klinik/wad dan “authorized requestor” sahaja. Pesakit tidak dibenarkan mengambil keputusan sendiri.
8. *Point of Care Testing* (POCT) :
 - a. Untuk memulakan sesuatu perkhidmatan POCT, ianya akan melibatkan Jawatankuasa POCT Hospital.
 - b. Ujian untuk POCT adalah menggunakan teknologi yang bersesuaian bagi memudahkan kakitangan bukan makmal (*non-laboratory trained user*) untuk melakukan ujian tersebut.
 - c. Pihak makmal patologi akan memberikan latihan dan mengadakan lawatan berkala ke *POCT site* untuk memastikan *Good Laboratory Practice* diamalkan.
 - d. Semua proses berkaitan operasi POCT adalah menjadi tanggungjawab jabatan atau unit yang berkenaan.

PROSEDUR OPERASI JABATAN PATOLOGI

1. Perkhidmatan

- a) Jabatan Patologi menawarkan ujian diagnostik yang dilakukan di makmal Jabatan Patologi, Hospital Tuanku Fauziah atau secara rujukan ke makmal luar mengikut perjanjian.
- b) Lokasi:
29A, Aras bawah, Blok Perkhidmatan Klinikal (Clinical Service Block).
Bersebelahan Jabatan Radiologi.
Berhadapan taman permainan kanak-kanak Wad Blok A.
- c) Waktu perkhidmatan adalah seperti berikut:
- Makmal Histositopatologi : Hari bekerja: 8.00 pagi - 5.00 petang
(penerimaan spesimen hingga jam 4.00 petang sahaja)
 - Mikrobiologi/Serologi : Hari bekerja: 8.00 pagi - 10.00 malam
Sabtu/Ahad/Cuti umum : 8.00 pagi - 10.00 malam
 - Makmal Patologi Kimia : 24 jam
 - Makmal Hematologi : 24 jam
 - Makmal Transfusi : 24 jam
 - Seksyen Pendermaan darah : Hari bekerja : 8.00 pagi - 5.00 petang
Rehat
Isnin-Khamis : 1.00 petang - 2.00 petang
Jumaat : 12.15 tengahari - 2.45 petang
- c) Fungsi teras makmal (skop perkhidmatan):
- i. Menyediakan perkhidmatan diagnostik dalam bidang Patologi Kimia, Mikrobiologi Perubatan, Hematologi, Transfusi, Histopatologi dan Sitopatologi.
 - ii. Menyediakan perkhidmatan perundingan kepada pakar dan pegawai perubatan.
 - iii. Menyediakan latihan makmal yang berkaitan kepada kakitangan kesihatan dan pelajar.
 - iv. Membina rangkaian dalam bidang pembangunan penyelidikan perubatan.
- d) Semua spesimen diterima di Kaunter Utama **KECUALI** senarai ujian dibawah yang diterima di Kaunter Unit :

Unit	Jenis Spesimen
Perubatan Transfusi	Semua spesimen
Histositopatologi	Semua spesimen kecuali <i>Seminal Fluid Analysis</i>
Haematologi	<i>BMA/Trephine biopsy</i>
Makmal Dadah	<i>Urine Drug</i>
Wabak (Kaunter Khas)	Semua spesimen dari PUI/PUS wabak

2. Prosedur Permohonan Ujian

- a) Semua permohonan ujian perlu menggunakan borang yang telah ditetapkan :

JENIS-JENIS BORANG	KEGUNAAN BORANG
PER-PAT 301	Untuk ujian umum (Termasuk <i>Full Blood Picture, Hb Analysis, BMA dan trephine biopsy</i>)
UPD 1 (Pindaan) PER(LAB) SS 301 A	Untuk ujian pengesanan dadah dalam air kencing (diterima ketika waktu pejabat sahaja)

Borang Kimia15 Pin1/2004	Untuk permohonan pemeriksaan forensik/toksikologi di Jabatan Kimia
PDN/HA/QP-01/01 (diisi dalam 2 salinan)	<i>Thrombophilia Screening</i> Ujian yang di hantar ke Pusat Darah Negara (PDN)
PER-PAT 301	Ujian Saringan HIV
PS 1/98 (Pindaan)	Borang Permohonan dan Laporan Ujian <i>Pap Smear</i>
HTF/PL/PK/B-03- NA	Ujian Saringan darah –program Congenital hypothyroidism
IMR/SDC/UMDP/MM	Multiple myeloma and other related diseases
IMR/SDC/BC/FORM- RQ	IEM request form
IMR/URDP/02	Ujian Molekular FISH – ANGELMAN PRADER FRAGILE X SYNDROME SMA GENE
HKL/HA/TPM/N-1(1)	Molecular Cytogenetis Conventional Cytogenetics Chromosomal study for peripheral blood
IMR/CaRC/HAEM/22/ 2203/03(1)REQForm	DNA Analysis for Thalassemia syndrome
PDN/HA/QP-01/01	DNA Analysis for Haemophilia A (PDN) and Haemophilia B (IMR- Molecular Analysis for Haemophilia)
BONE MARROW CYTOGENETIC REQUEST FORM (IMR)	Bone Marrow Cytogenetics
Borang Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	Permohonan ujian GSH, GXM & permohonan bekalan darah & komponen darah
HTF/PL/TM/IH/B-02	Borang Pengambilan Darah/Komponen Darah
<i>Reporting Form for Transfusion-Related Adverse Event Transfusion Medicine Service</i> Kementerian Kesihatan Malaysia, BTS/HV/3/2016	Laporan Reaksi Transfusi Darah/Komponen Darah, Laporan kes Near Miss/Transfusion Error
TBIS 20C	Semua ujian berkaitan <i>Mycobacterium tuberculosis</i> (Kecuali Blood for MTB C&S)
IMR/AIRC/Autoimmun e/RF	Ujian Autoimmune (Kecuali ANA,dsDNA,ENA dan Tissue Antibodies)
IMR/BACT/FORMS/S MIS/01	Ujian identifikasi dan sensitivity antibiotik

*Untuk maklumat lanjut, sila rujuk [SENARAI UJIAN DI JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS YANG DIHANTAR KE MAKMAL RUJUKAN LUAR.](#)

- b) Setiap borang permohonan hendaklah diisi dengan **LENGKAP**
- Nama Penuh
 - No KP/No AE/No Passport/No KP ibu/No Mykid
 - Umur (jika tiada No KP / No Mykid)
 - Wad/Klinik
 - Diagnosis dan indikasi ujian dipohon
eg: NIDDM, TRO Coagulopathy
 - Ringkasan klinikal (jika perlu, bergantung kepada jenis ujian)
 - *Clinical presentation*
 - Jenis rawatan yang diberi
 - Jenis ujian yang dipohon (**dengan jelas**)
 - **Nama, tandatangan dan cop** Pegawai Perubatan yang memohon
 - Tandatangan Pakar (jika perlu, bergantung kepada jenis-jenis ujian)
 - Tarikh dan masa spesimen diambil
 - Lain-lain perkara mengikut polisi setiap unit. Sila rujuk kriteria penerimaan dan penolakan setiap unit. (Rujuk bahagian unit berkenaan : [Unit Perubatan Transfusi](#), [Unit Histositopatologi](#), [Unit Patologi Kimia](#), [Unit Mikrobiologi](#), [Unit Hematologi](#)).
- Nota: Borang permohonan yang tidak lengkap akan menyebabkan permohonan ujian **ditolak atau tertangguh**.
- c) Permohonan ujian hanya boleh dilakukan oleh **Pegawai Perubatan Berdaftar** sahaja dengan pengecualian kepada ujian *Pap Smear*. Kategori pegawai yang layak untuk memohon ujian-ujian akan dinyatakan dengan lebih jelas di dalam ruang unit berkenaan.
- d) Spesimen
- Pastikan butiran di tiub spesimen adalah **sama** dengan butiran di borang permohonan (sekurang-kurangnya **Nama, No KP/No RN/No Passport/No AE, jenis ujian**). Sebarang *discrepancy* (ketidaksamaan) akan menyebabkan permohonan ditolak. Sila rujuk tatacara penglabelan sampel bagi setiap unit di ruang unit berkenaan.
 - Tandatangan ringkas phlebotomist pada label spesimen adalah diwajibkan untuk spesimen bagi ujian di **Unit Tranfusi**.
 - Setiap spesimen daripada kes berisiko “biohazard” mestilah dilabel atau ditanda, jika perlu.
 - Setiap spesimen perlu diambil/disampel dengan menggunakan tatacara yang betul mengikut jenis ujian. Sila rujuk tatacara pengambilan spesimen ujian yang berkenaan.
- e) Permohonan untuk ujian tambahan (*add on test*)
- Hanya akan diterima dalam tempoh **4 jam** daripada masa penerimaan spesimen di makmal (bergantung kepada jenis ujian).
 - Permohonan melalui telefon mestilah disusuli dengan borang permohonan.
 - Ujian hanya akan dilakukan apabila borang permohonan diterima.
- f) Permohonan untuk ujian **SEGERA**
- Lekatkan stiker atau tuliskan “SEGERA” atau seumpamanya pada borang permohonan ujian.
 - Spesimen yang dilabel “SEGERA” atau seumpamanya akan diberi keutamaan di kaunter penerimaan Makmal Patologi.
 - Sampel ujian segera tidak boleh dihantar menggunakan tiub pneumatik.
 - Sampel untuk ujian segera mesti diasingkan daripada sampel ujian biasa dan perlu dimaklumkan kepada petugas kaunter.
 - Sila rujuk “Guidelines on Urgent Test Requests” di **Appendix 9**.

Nota: Pastikan permohonan ujian “SEGERA” adalah **hanya** untuk kes yang memerlukan rawatan segera. **Penyalahgunaan permohonan** ”SEGERA” akan melambatkan TAT (turnaround time) untuk ujian yang betul-betul memerlukan keputusannya secara SEGERA.

3. Pengambilan dan Penghantaran Spesimen

Sila rujuk “Panduan Pengambilan Spesimen” dan “Panduan Penghantaran Spesimen” pada “Senarai Ujian di Jabatan Patologi, Hospital Tuanku Fauziah, Kangar, Perlis”.

4. Keputusan Ujian

- Semua ujian - Semua keputusan akan dihantar ke destinasi yang dinyatakan pada borang permohonan mengikut kaedah:
 - Melalui telefon
 - Melalui “pigeon hole”
 - Perkhidmatan kurier
 - Sistem “porter”
 - Faks/email
 - Diberi kepada kakitangan wad yang menunggu
 - Melalui *Laboratory Information System (LIS)/Web based*
- Keputusan ujian yang abnormal dan memenuhi criteria **Critical Value**:
 - Keputusan akan dimaklumkan melalui telefon oleh kakitangan yang bertugas dan akan disusuli dengan keputusan bertulis. Sila Rujuk lampiran **Appendix 8** untuk senarai ujian dan **Critical Value**.
- Keputusan ujian yang sulit (seperti HIV dan lain-lain) akan dihantar di dalam sampul surat.
- Sekiranya berlaku kelewatan atau kemungkinan berlaku kelewatan dalam pengeluaran keputusan, pemohon akan dimaklumkan secara bertulis dan/atau *verbal*.
- Sekiranya terdapat kesilapan pada keputusan yang telah dikeluarkan:
 - Pemohon akan dimaklumkan.
 - Keputusan yang dipinda akan dikeluarkan dan bertulis ‘PINDAAN’ atau “*AMENDED REPORT*”. Hanya pegawai yang bertanggungjawab sahaja boleh mengesahkan pindaan ini.
 - Keputusan awal akan ditarik balik dan perlu dikembalikan ke makmal untuk mengelakkan kekeliruan.
- Ujian yang dikeluarkan keputusan awal atau *preliminary result* akan disusuli dengan keputusan muktamad (untuk ujian tertentu).
- Jika pembetulan keputusan ujian dipohon oleh pihak pemohon, mereka berkemungkinan akan diminta untuk mengisi Borang Permohonan Pembetulan Keputusan (Report Amendment) oleh Pelanggan HTF/PL/B-38. Borang tersebut perlu mendapat pengesahan pakar daripada pihak pemohon. Adalah menjadi tanggungjawab pakar tersebut untuk memaklumkan permohonan tersebut kepada Ketua Jabatan masing-masing.

5. Penolakan Permohonan Ujian

Sebarang permohonan yang tidak memenuhi kriteria akan menyebabkan permohonan ujian ditolak.

KRITERIA PENOLAKAN:

1	Masalah Borang
1a	Tiada Borang
1b	Salah borang
1c	Helaian tidak mencukupi

1d	Borang dicampuraduk ujian segera dan tidak segera
1e	Borang tidak lengkap/tidak jelas/tidak tepat pada perkara di bawah:
1ei	Maklumat pesakit
1eii	Nama pesakit
1eiii	Nombor identiti/RN Hospital (Sekurang-kurangnya satu)
1eiv	Jantina
1ev	Umur
1evi	Diagnosis
1evii	Sejarah pesakit (mengikut jenis ujian)
1eviii	Permintaan ujian
1eix	Tarikh dan masa
1ex	Nama pemohon
1exi	Tandatangan pemohon dan cop
2	Masalah Label
2a	Nama pesakit seperti pada borang permohonan
2b	Nombor identiti seperti pada borang
2c	Jenis ujian
3	Masalah spesimen
3a	Penggunaan botol salah
3b	Botol specimen pecah/bocor
3c	Tidak cukup isipadu
3d	Tiada spesimen
4	Masalah Permohonan Ujian (Pakar sahaja)
4a	Ujian tidak perlu
4b	Ujian diulang semula kurang daripada tempoh
4c	Ujian dipohon oleh bukan pakar/MO senior (ujian khas)

- Sila rujuk kriteria tambahan daripada setiap unit di Jabatan Patologi.
- Tiada tandatangan pada ruang pengakuan phlebotomist di borang **Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)**.
- Tiada tandatangan ringkas semakan kedua oleh Jururawat/Penolong Pegawai Perubatan (Transfusion-Link-Nurse) di borang **Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)**. Rujuk Borang Penolakan Permohonan Ujian Unit Transfusi HTF/PL/TM/IH/B-01 untuk maklumat lanjut mengenai kriteria penolakan.

Nota: Untuk permohonan ujian yang melibatkan sampel yang tidak dapat diulang semula pengambilannya, ujian akan cuba dilakukan walaupun spesimen tidak memenuhi kriteria selagi ia tidak mengganggu gugat integriti ujian (tersalah pesakit, menyebabkan pesakit menerima rawatan yang salah dan merbahaya kepada pesakit jika diterima beliau dan sebagainya) dan akan disertakan dengan ulasan/komen di dalam keputusan (Cth CSF/BMA/HPE).

6. Kawalan mutu

Program kawalan mutu dilakukan secara berjadual untuk meningkatkan kebolehpercayaan terhadap keputusan yang dilaporkan. Semua unit di makmal patologi HTF adalah terlibat dengan aktiviti-aktiviti kawalan mutu iaitu:

- Kawalan mutu dalaman (IQC)
- Kawalan mutu luaran (EQA)

7. Aduan Pelanggan

- Sebarang aduan atau ketidakpuasan boleh dikemukakan kepada:
 - Ketua Jabatan
 - Ketua Unit
 - Talian ext 8188 (PIC Aduan)
 - Email (patologihtf@moh.gov.my)secara *verbal* atau bertulis dengan kadar segera untuk membolehkan siasatan dilakukan.
- Pihak jabatan akan berusaha untuk menyiasat semua aduan dan maklumbalas akan diberi kepada pelanggan dalam **tempoh 14 hari**.

TATACARA PENGAMBILAN SPESIMEN (UMUM)

Perkara-perkara berikut perlu diberikan perhatian:

1. Identifikasi Pesakit

- Sahkan identiti pesakit dengan bertanyakan nama pesakit (sekiranya pesakit sedar dan rasional) **DAN** dengan menyemak lain-lain identifikasi yang ada seperti *wristband* pada pesakit sebelum pengambilan spesimen dilakukan .

2. Jenis Spesimen

- Pastikan spesimen yang diambil adalah betul mengikut jenis ujian yang diminta.

3. Masa Pengambilan

- Pastikan spesimen diambil pada masa yang betul.
- Keputusan ujian boleh dipengaruhi oleh masa pengambilan spesimen.

4. Teknik Pengambilan

- Pastikan teknik pengambilan adalah betul.
- Pengambilan spesimen darah daripada '*infusion site*' akan menyebabkan keputusan yang tidak tepat.
- Penggunaan *tourniquet* yang terlalu lama (>3 minit) dan kesan alkohol yang tidak kering juga akan menyebabkan sampel lisis.
- Jika pengambilan spesimen tidak mengikut tatacara yang telah digariskan di dalam buku panduan ini, pihak pemohon hendaklah menyatakannya dengan jelas dalam borang permohonan.

5. Bekas/Container

- Pastikan tiub/bekas yang digunakan adalah betul mengikut jenis ujian.
- Pastikan tiub/bekas yang mempunyai kandungan '*additive*' adalah belum mencapai tarikh luput.
- Bagi spesimen darah, masukkan darah ke dalam tiub/bekas spesimen mengikut urutan seperti berikut :
 - i) C&S (*culture and sensitivity*)
 - ii) Tiub *additive*
 - iii) Tiub tanpa *additive* (*plain tube*)
- * Bagi *close system* sila rujuk panduan dari pembekal*
- **Label serta merta** setelah bekas/container tersebut dimasukkan spesimen.
- Elakkan daripada melakukan penglabelan dan pengambilan spesimen untuk 2 orang pesakit pada masa yang sama untuk mengelakkan kekeliruan.

6. Label

- Bekas spesimen hendaklah dilabel dengan jelas.
 - Nama dan No KP (atau nombor unik yang lain seperti No AE/No Passport/No KP ibu/No Mykid dan sebagainya). Pastikan maklumat diisi sama seperti yang diisi di dalam borang.
 - Jenis ujian dipohon
 - Tarikh dan masa (jika perlu) spesimen diambil (tidak perlu jika sudah dinyatakan di dalam borang)
 - Bekas spesimen tidak boleh **dipre-label** untuk mengelakkan kesilapan

TATACARA PENGURUSAN SPESIMEN WABAK

1. Pengambilan Spesimen

NO.	ACTIVITY	RESPONSIBILITY
1.1	Kenalpasti pesakit "Suspected Case/Person Under Investigation (PUI)/Confirmed Case" yang perlu diambil spesimen ujian makmal.	Staf Wad
1.2	<p>Maklum kepada petugas makmal. Maklumkan juga jenis ujian yang hendak dilakukan.</p> <p>Jenis ujian:</p> <ol style="list-style-type: none"> 1. Mikrobiologi/Hematologi/Patologi Kimia: Maklum kepada Kaunter Jabatan. 2. Histositopatologi: Maklum kepada Pakar Patologi Histositopatologi. <p>Datang ke makmal untuk mengambil "sampling kit", bekas plastik (untuk ujian lain selain ujian pengesahan), bekas spesimen, cecair pengawet/fiksatif dan lain-lain (jika perlu).</p>	Staf Wad
1.3	<p>Maklumkan kepada staf bertugas berkenaan penghantaran spesimen tersebut.</p> <p>Bekalkan "sampling kit", bekas plastik (untuk ujian lain selain ujian pengesahan), bekas spesimen, cecair pengawet/fiksatif dan lain-lain (jika perlu).</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. "Sampling kit" untuk ujian pengesahan. 2. Bekas plastik selain ujian pengesahan (Ujian analisa darah seperti RP/FBC/blood gas dan lain-lain/kultur kahak/kultur aspirasi trakea/kultur darah). 3. Cecair pengawet/fiksatif (jika perlu) untuk ujian Histopatologi dan Ujian Sitologi. 	Staf Kaunter Jabatan/ JTMP Unit Histositopatologi
1.4	<p>Lakukan pengambilan spesimen mengikut polisi dan prosedur yang ditetapkan jabatan masing-masing.</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. Spesimen PCR, Histopatologi dan Sitologi hendaklah dihantar menggunakan "Triple packaging". 2. Spesimen lain (Ujian analisa darah seperti RP/FBC/blood gas dan lain-lain/kultur kahak/kultur aspirasi trakea/kultur darah) dihantar menggunakan bekas plastik. 3. Borang permohonan perlu diasingkan daripada spesimen. 4. Kotak polisterine perlu diletakkan berasingan bagi ujian yang perlu dihantar ke 2 makmal yang berbeza; contoh SARI COVID-19 & Respiratory Pathogen. 	Staf Wad

	<p>5. Kotak polisterine boleh kongsi dua (2) spesimen "secondary container (pastikan ujian yang sama).</p> <p>6. Sekiranya spesimen respiratori yang diambil tidak menggunakan swab & VTM, pihak wad perlu memulangkan semula swab & VTM ke Makmal Mikrobiologi secepat mungkin.</p> <p>7. LABEL sebagai pesakit wabak (Contoh: POSITIF COVID-19/MERS-CoV/PUI dan sebagainya).</p> <p>8. Borang dimasukkan ke dalam beg "biohazard" yang BERBEZA.</p>	
1.5	Maklum kepada staf Kaunter Jabatan atau JTMP Unit Histositopatologi (Ujian Histopatologi dan Ujian Sitologi) sebelum penghantaran dibuat.	Staf Wad
1.6	<p>Hantar ke Kaunter Khas Patologi dengan menggunakan laluan yang ditetapkan.</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. Pastikan memakai PPE (sekurang-kurangnya "glove" dan "plastic apron"). 2. Pastikan tangan dicuci dengan "hand sanitizer" sebelum dan selepas penyerahan spesimen dilakukan. 	Staf Wad

2. Penerimaan Spesimen, Pengendalian, Pemprosesan Spesimen dan Pengeluaran Keputusan

NO.	ACTIVITY	RESPONSIBILITY
2.1	<p>Terima spesimen di Kaunter Khas Patologi.</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. Pastikan memakai PPE (sekurang-kurangnya "glove" dan "plastic apron"). 2. Pastikan tangan dicuci dengan "hand sanitizer" sebelum dan selepas penyerahan spesimen dilakukan. 3. Sembur cecair 70% alcohol ke atas permukaan bungkusan spesimen yang diterima. 	JTMP
2.2	<p>Periksa spesimen dan borang yang telah diterima.</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. Pakai PPE yang bersesuaian contoh "glove". 	JTMP
2.3	<p>Proses dan analisa spesimen.</p> <p>"Decontaminate"/cuci peralatan. "fumehood" dan Biosafety Cabinet (BSC) dengan menggunakan 70% alcohol selepas penggunaan.</p> <p>Nota:</p> <ol style="list-style-type: none"> 1. Pakai PPE yang bersesuaian dengan jenis spesimen/ujian yang diterima. 2. Buka "Triple packaging" dengan berhati-hati. "Decontaminate" permukaan "primary container" 	Semua staf Jabatan Patologi

	<p>dengan 70% alcohol.</p> <p>3. Jika emparan diperlukan, spesimen perlu menggunakan "closed bucket" semasa emparan, kemudian dibiarkan selama 5-10 minit sebelum penutup mesin pengempar dibuka. Spesimen perlu dibuka di dalam BSC.</p> <p>4. Buang plastik, gauze yang telah digunakan ke dalam bekas pelupusan khas di dalam BSC/Fumehood.</p>	
2.4	Interpretasi keputusan. Masukkan keputusan ke dalam LIS (jika perlu). Lakukan validasi dan keluarkan keputusan mengikut prosedur yang ditetapkan.	JTMP/Pegawai Sains/Pegawai Perubatan/Pakar Patologi

TATACARA PENGAMBILAN DAN PENGHANTARAN SPESIMEN UNTUK KES MEDICOLEGAL (*RAPE CASE*)

1. Pastikan bekas yang digunakan betul.
2. Hantar spesimen-spesimen ke makmal berserta borang yang lengkap.

Bil	Panduan Penghantaran Spesimen	Bekas
1	<p><u>Ujian <i>Trichomonas vaginalis</i></u> Lakukan palitan (<i>smear</i>) pada slaid dan celupkan dengan segera ke dalam 95% alkohol selama 15 minit atau cyto spray.</p> <p>*Ujian spermatozoa tidak lagi ditawarkan oleh makmal ini berdasarkan panduan yang digariskan dalam “<i>Guideline on Standardization of Workload Data Collection 4th Edition 2016</i>”. Semua ujian perlu dirujuk kepada Jabatan Kimia, Pulau Pinang.</p>	Slaid
2	<p><u>Ujian gonococcus</u> Lakukan palitan pada slaid dan biarkan kering di udara (air-dry)</p>	Slaid
3	<p><u>Ujian C&S untuk gonococcus</u> Ambil ENDOCERVICAL swab dan dimasukkan ke dalam Amies media</p>	Amies Medium (hitam)
4	<p><u>Ujian C&S yang lain</u> Masukkan sampel ke dalam bekas (container) atau media angkut yang telah ditetapkan (rujuk jadual SENARAI UJIAN DI JABATAN PATOLOGI)</p>	Bergantung kepada jenis spesimen yang diambil
5	Ujian HIV/HBV/HCV/VDRL	Plain gel tube (blood sample)
6	Blood grouping	EDTA
7	Ujian Kehamilan (UPT)	Bekas urin

TATACARA PENGAMBILAN DAN PENGHANTARAN SPESIMEN UNTUK KES PENDERMAAN ORGAN

INVESTIGATIONS	FREQUENCY	LABORATORY	NOTE
ABO Group	Once only	Local laboratory/ Blood Bank	-For organ donation only -ABO results to be informed immediately via telephone, followed by formal documentation form the blood bank.
Infectious diseases screening HIV Ab & Ag Hep Bs Ag Hep Bs Ab Hep B core Ab Anti Hep C Virus CMV IgG Toxoplasma IgG VDRL	Once only for all	Local laboratory	-For both organ and tissue donation -Results of Virology screen and VDRL screen is to be informed as soon as possible via telephone, followed by formal documentation from the laboratory.
Renal Profile	6 hourly	Local laboratory	-Blood samples to be labelled and traced urgently.
FBC	Once daily	Local laboratory	
LFT	Once daily	Local laboratory	
Coagulation profile	Once daily	Local laboratory	
Cardiac enzymes	Once daily	Local laboratory	-For heart donation only
HLA	Once only	IMR	-Blood collected into 8 Sodium Heparin tubes. -Maximum of 9ml of blood collected in each tube. -Blood sample to be taken before the administration of IV methylprednisolone.
Urine FEME	Once only	Local lab or urine dipstick kit in the ward	

- All blood samples are to be labelled urgent and for the purpose of organ donation.
- Blood samples for ABO grouping and infectious diseases screen must be delivered by local TOP team to the local laboratory. Time, name and contact number of the laboratory technician receiving the blood sample must be documented.
- For HLA blood samples, the local TOP team will have to arrange for delivery of blood to IMR in Kuala Lumpur. Name and contact number of person delivering the blood to IMR must be informed to NTRC coordinators.

POLISI PERLINDUNGAN DATA DAN KERAHSIAAN MAKLUMAT PESAKIT JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH

Rujukan:

1. Confidentiality Guidelines Malaysian Medical Council, 11 October 2011
2. Garispanduan Pengendalian dan Pengurusan Rekod Perubatan Pesakit Bagi Hospital-hospital dan Institusi Perubatan Kementerian Kesihatan Malaysia, Perkeliling Ketua Pengarah Kesihatan Bil 17/2010.
3. Garispanduan Keselamatan Rekod Perubatan (Dokumen No 3), Unit Sistem Maklumat dan Dokumentasi Kementerian Kesihatan Malaysia, Februari 1993.

Polisi:

1. Pesakit, penderma darah dan pengamal perubatan (selepas ini dirangkum diganti dengan “pelanggan”) mempunyai hak untuk merasakan tiada maklumat peribadi yang diberikan semasa proses rawatan dan pendermaan darah boleh didedahkan melainkan setelah mendapat persetujuan (consent) daripada mereka.
2. Dalam keadaan-keadaan tertentu, Jabatan Patologi Hospital Tuanku Fauziah (selepas ini akan digantikan dengan “Makmal ini”) boleh mendedahkan maklumat peribadi tersebut jika:
 - a. ia diperuntukkan oleh undang-undang;
 - b. dengan persetujuan pelanggan (consent);
 - c. terdapat kepentingan umum. (Sila rujuk Confidentiality Guidelines Malaysian Medical Council, 11 October 2011)
3. Jika pendedahan perlu dibuat oleh sebab-sebab yang dinyatakan di perkara 2, Makmal ini akan memastikan:
 - a. dengan sedaya upaya akan menggunakan kod atau nama samaran;
 - b. mendapatkan persetujuan (consent) melainkan ia melibatkan proses rawatan atau audit klinikal, diperlukan seperti yang diperuntukkan oleh undang-undang atau terdapat kepentingan umum (Sila rujuk Confidentiality Guidelines Malaysian Medical Council, 11 October 2011).
4. Makmal ini akan sedaya upaya akan memastikan semua maklumat pelanggan diserahkan kepada pemohon yang berhak sahaja (selepas ini akan digantikan dengan “authorized requestor”).
5. Makmal ini akan memastikan sebarang kaedah pendedahan maklumat pelanggan kepada “authorized requestor” dengan menggunakan mana-mana teknologi (telefon, faks, email, surat, “web-based” dan sebagainya perlu mengikut proses dan prosedur tertentu bagi memastikan kerahsiaan maklumat pelanggan senantiasa dilindungi.
6. Pihak Makmal ini akan mengelak dari berbincang berkenaan pelanggan ditempat yang terbuka yang mana berisiko didengari oleh pihak ketiga atau meletakkan maklumat pelanggan (samada di atas kertas atau pada skrin computer) dimerata-rata tempat yang mana boleh dilihat oleh orang tidak berkenaan. Jika perbincangan perlu dilakukan, ia akan dilakukan ditempat yang tertutup.
7. Makmal ini akan menyediakan proses dan prosedur kerja untuk memastikan sistem rekod maklumat pelanggan diurus dengan teratur dan seterusnya dapat melindungi data peribadi pelanggan.
8. Makmal ini akan melantik seorang atau beberapa orang pengurus untuk menguruskan sistem maklumat makmal (selepas ini akan digantikan dengan “LIS”). Pengurus LIS ini akan sentiasa memastikan integriti sistem, keselamatan maklumat dan kerahsiaan data peribadi pelanggan terlindung.
9. Perkara-perkara yang diambil kira bagi memastikan kerahsiaan data pelanggan adalah:
 - a. memastikan keselamatan fizikal rekod pelanggan bagi memastikan maklumat pelanggan tidak dapat dicapai oleh mereka yang tidak berhak;
 - b. memastikan log audit bagi setiap capaian;

- c. menyediakan tahap capaian kepada semua “authorized personnel”, Makmal ini akan memastikan mereka diberi kata laluan yang akan diperbarui mengikut tempoh masa yang tertentu;
 - d. memastikan dan melindungi mana-mana bahagian data/maklumat dipadam secara tidak sah;
 - e. memastikan “read only format” bagi maklumat/data yang disimpan;
 - f. “backup” data dilakukan mengikut tempoh masa yang selamat dan dipersetujui;
 - g. menjaga perisian computer daripada serangan “malware”, “virus” dan sebagainya;
 - h. merangka plan kontigensi.
10. Makmal ini akan menjaga sensitiviti dengan memastikan pelanggan “Very Important Person” (selepas ini digantikan dengan VIP), medikolegal dan sebagainya yang dirasakan perlu, tidak akan didedahkan pada paparan skrin LIS.
 11. Rekod perubatan pelanggan adalah hakmilik hospital manakala maklumat di dalam rekod perubatan pelanggan adalah hak pelanggan. Jika pelanggan memerlukan maklumat tersebut, pihak hospital akan mengeluarkan laporan tersebut di dalam bentuk laporan, bukannya salinan asal rekod perubatan pelanggan.
 12. Makmal ini akan memastikan semua staf Makmal ini menandatangani surat akujanji dan etika untuk melindungi kerahsiaan maklumat pelanggan.
 13. Pelanggan tidak dibenarkan memegang atau membawa rekod mereka semasa berjumpa doktor atau semasa berurusan dengan unit-unit lain.

PROSEDUR PENGGUNAAN LABORATORY INFORMATION SYSTEM (LIS) UNTUK MENGESAN KEPUTUSAN UJIAN PESAKIT

1. Penggunaan sistem ini adalah bagi tujuan mengesan (*tracing*) keputusan ujian pesakit di bawah jagaan dan seliaan pengguna berdaftar sahaja.
2. Sistem ini hanya boleh diakses menggunakan talian internet di pejabat sahaja (**lgovnet**). Capaian pantas boleh didapati di laman sesawang **intranet** Hospital Tuanku Fauziah.
[e-Delphyn : <http://10.158.26.64:8080/edelphynlis/login.jsp>]
[i-Lab : <http://10.158.25.121>]
3. Pengguna boleh mendapatkan akses kepada sistem ini dengan membuat permohonan *User ID* daripada Jabatan Patologi, Hospital Tuanku Fauziah.
4. Pengguna adalah bertanggungjawab memastikan kerahsiaan semua data dan maklumat berkaitan pesakit adalah terjamin sepanjang masa.
5. Pengguna adalah tidak dibenarkan berkongsi *User ID* dan katalaluan pengguna.
6. Pengguna adalah tertakluk kepada semua kod etika profesional, perundangan, polisi, peraturan dan pekeliling yang berkaitan antaranya seperti berikut (tidak terhad kepada senarai ini sahaja);
 - a. The Medical Act 1971
 - b. Malaysian Medical Council (MMC) Ethical Codes and Guidelines
 - c. Management of Patient Medical Records in Hospital and Medical Institution 2010
 - d. ICT Security Policy 2010
 - e. Personal Data Protection Act 2010
 - f. User Access Control Policy and Guidelines 2011
7. Pengguna perlu membaca, memahami dan akur akan peruntukan-peruntukan yang terkandung di dalam Dasar Keselamatan ICT Kementerian Kesihatan Malaysia.
8. Jika pengguna ingkar kepada peruntukan-peruntukan yang ditetapkan, maka tindakan sewajarnya boleh diambil ke atas pengguna.

UNIT PERUBATAN TRANSFUSI

1. POLISI-POLISI KHAS UNIT TRANSFUSI

Terdapat tiga polisi yang merangkumi arahan KKM dan HTF untuk memastikan perawatan transfusi dan komponen darah selamat dan betul iaitu :

- i. **SEPULUH LANGKAH BIJAK MENGURANGKAN RALAT (ERROR) TRANSFUSI**
- ii. **POLISI PERMOHONAN BAGI UJIAN DARAH DAN KOMPONEN DARAH**
- iii. **TATACARA "BLOOD ADMINISTRATION"/ TRANSFUSI DARAH**

2. SEPULUH LANGKAH BIJAK MENGURANGKAN RALAT (*ERROR*) TRANSFUSI

Merujuk kepada surat Ketua Pengarah (KKM) Rujukan (28) dlm/PDN/12-02 jld 4 bertarikh 17.5.2012.

2.1 DI HOSPITAL/WAD

2.1.1 Pengambilan sampel darah pesakit yang memerlukan transfusi darah.

- i. Kenal pasti pesakit yang betul sebelum sampel darah diambil.
- ii. Ambil sampel dan labelkan dengan maklumat pesakit yang betul. Ambil darah pesakit seorang demi seorang; selesaikan pengambilan sampel darah seorang pesakit sebelum memulakan pengambilan sampel pesakit yang lain.
- iii. **JANGAN** membantu atau meminta bantuan orang lain untuk mengambil sampel darah pesakit yang akan anda labelkan, atau melabelkan sampel darah yang diambil oleh orang lain (Tiada istilah gotong royong di dalam pengambilan sampel pesakit).
- iv. **JANGAN** biarkan sampel darah yang tidak berlabel di merata-rata tempat.
- v. **JANGAN** simpan sampel darah yang tidak berlabel untuk digunakan kemudian.

2.1.2 Pemberian transfusi darah kepada pesakit

- vi. Kenalpasti produk darah yang hendak ditransfusi kepada pesakit adalah produk yang betul dan pastikan pesakit yang bakal menerima transfusi darah tersebut juga adalah pesakit yang betul.
- vii. Sekurang-kurangnya dua (2) orang kakitangan perlu melakukan verifikasi pengenalan pesakit dan produk darah yang hendak diberikan kepada pesakit sebelum transfusi dimulakan.
- viii. Ulang langkah-langkah mengenalpasti pesakit dan produk darah bagi setiap beg darah yang hendak digunakan. Langkah tersebut perlu dilakukan sebelum transfusi.

2.2 DI TABUNG DARAH

- ix. Darah yang dibekalkan oleh tabung darah kepada wad hendaklah darah yang betul mengikut permohonan yang diterima. Permohonan hendaklah disertai dengan dokumentasi bertulis.

2.3 LANGKAH UMUM

- x. Jika timbul sebarang keraguan, kemusykilan atau percanggahan maklumat, data atau keputusan ujian makmal, tangguhkan dahulu transfusi atau pembekalan darah dan rujuk kepada Pegawai Perubatan atau Pakar yang bertugas.

3. POLISI PERMOHONAN BAGI UJIAN DARAH DAN KOMPONEN DARAH

3.1 Semua permohonan mestilah mengikut garis panduan yang ditetapkan dalam polisi am jabatan. Rujuk Buku Panduan Makmal Patologi Hospital Tuanku Fauziah yang dimuatnaik di dalam Intranet HTF.

- 3.2 Bagi kes-kes ibu mengandung atau kes-kes pembedahan elektif yang diketahui mempunyai :
- kumpulan darah RhD negatif
 - antibodi terhadap sel darah merah
 - kumpulan darah ganjil (rare blood) seperti Bombay, Parabombay dan sebagainya

Unit Transfusi hendaklah dimaklumkan sekurang-kurangnya seminggu atau lebih awal supaya persediaan untuk darah yang sesuai dapat dilakukan.

- 3.3 Ujian keserasian darah (GXM) untuk pesakit paediatric yang berumur < 4 bulan memerlukan sampel darah ibu (EDTA-6ml) dihantar bersama dengan sampel darah bayi (microtainer EDTA-0.5 ml) dan perlu nyatakan identiti ibu dan bayi pada label di setiap tiub.
- 3.4 Semua permohonan darah dan komponen darah, Pegawai/ Pakar Perubatan yang merawat pesakit dikehendaki menghubungi dan berbincang dengan Pegawai/ Pakar Perubatan Unit Transfusi atas panggilan terlebih dahulu dengan menyatakan indikasi, keputusan ujian berkaitan, jenis dan jumlah darah / komponen yang dimohon. Kod akan diberikan untuk setiap permohonan yang diluluskan. Untuk sebarang masalah atau pertanyaan, konsultasi hendaklah dibuat melalui Pegawai/ Pakar Perubatan Transfusi atas panggilan.
- 3.5 Pemohon perlu menghantar borang permohonan ke Makmal Transfusi. Permohonan hanya akan diproses selepas penerimaan borang permohonan. Ia bertujuan untuk mengelakkan berlakunya kekeliruan mengenai maklumat pesakit.
- 3.6 Permohonan untuk darah dan komponen darah hanya dibenarkan untuk kes-kes yang telah dipastikan memerlukan rawatan transfusi tersebut. Ini adalah untuk mengelakkan pembaziran unit yang telah disediakan.
- 3.7 Sampel validiti
- 3.7.1 Untuk permohonan yang ditolak, sekiranya berlaku kecemasan di mana sampel ulangan tidak dapat dihantar ke Makmal Transfusi, darah akan dibekalkan mengikut polisi untuk *Emergency Transfusion*.
 - 3.7.2 Sampel untuk permohonan ujian GSH akan disimpan selama 72 jam untuk tujuan *convert* ke GXM. Tempoh 72 jam bermula daripada waktu sampel diterima di Makmal Transfusi. Tarikh luput ujian akan dinyatakan di belakang borang permohonan.
 - 3.7.3 Unit darah yang telah dilakukan GXM akan disimpan untuk pesakit untuk tempoh 48 jam sahaja daripada tarikh GXM. Tarikh luput ujian akan dinyatakan di belakang borang permohonan. Selepas tempoh tersebut, unit darah yang tidak digunakan ini akan dikembalikan ke *general stock* kecuali atas arahan Pegawai/ Pakar Perubatan Transfusi atas panggilan.
- 3.8 Pembekalan darah atau komponen darah
- 3.8.1 Pegawai/ Pakar Perubatan perlu merancang agar transfusi darah untuk pesakit dilakukan sebelum jam 9 malam untuk mengelakkan berlakunya kesilapan teknikal dan kurangnya pengawasan pesakit disebabkan kekurangan tenaga kerja. Sekiranya transfusi amat perlu dan tidak dapat dielakkan, Pegawai/ Pakar Perubatan yang merawat pesakit perlu menghubungi Pegawai / Pakar Perubatan Transfusi atas panggilan.
 - 3.8.2 Rujuk '*Transfusion Practice Guidelines for Clinical and Laboratory Personnel, National Blood Centre, Ministry of Health Malaysia, 4th Edition 2016*' yang telah dimuat naik ke Intranet HTF. Boleh juga di muat turun dari laman sesawang www.pdn.gov.my, Chapter 9: Issue and Transport of Blood to the ward (page 49-50).
- 3.9 Keizinan untuk transfusi darah (*Written Informed Consent*)

- 3.9.1 Semua keizinan untuk transfusi darah perlu dilakukan secara bertulis termasuk untuk kes kecemasan. Dapatkan keizinan transfusi darah daripada pesakit atau waris dengan menggunakan borang Persetujuan Pemindahan Darah atau Komponen Darah (BTS/TC/2/2016) sebelum transfusi dilakukan.
- 3.9.2 Dicadangkan supaya keizinan transfusi darah diambil sebelum sebarang pembedahan dilakukan.
- 3.9.3 Untuk kes kecemasan dan bertujuan untuk *lifesaving*, yang mana pesakit atau waris tidak dapat memberikan keizinan, borang keizinan transfusi darah perlu ditandatangani oleh 2 orang pakar yang merawat pesakit tersebut (contoh seperti pesakit tidak sedarkan diri dan ketiadaan waris, pesakit kanak-kanak di bawah usia 18 tahun yang ketiadaan waris atau pesakit psikiatri yang *mentally unfit* untuk memberikan consent).
- 3.10 Pengendalian darah dan komponen

Mestilah mengikut prosedur yang ditetapkan:

Rujuk '*Transfusion Practice Guidelines for Clinical and Laboratory Personnel, National Blood Centre, Ministry of Health Malaysia, 4th Edition 2016*' yang telah dimuat naik ke Intranet HTF. Boleh juga di muat turun dari laman sesawang www.pdn.gov.my, *Appendix 12: Instructions on Proper Handling of Blood and Blood Components in the Ward. (page: 134)*
- 3.11 Ujian Group, Screen and Hold (GSH)
 - 3.11.1 Merangkumi ujian kumpulan ABO dan Rh, diikuti ujian saringan untuk mengesan kehadiran antibodi terhadap sel darah merah pesakit.
 - 3.11.2 Tiada unit darah disimpan untuk pesakit dengan permohonan GSH.
 - 3.11.3 Sekiranya GSH positif (antibodi dikesan)

Pihak wad akan dimaklumkan dan sampel untuk ujian identifikasi antibodi perlu dihantar ke Makmal Tranfusi dengan segera untuk ujian lanjutan.
 - 3.11.4 Untuk kes dimana jenis antibodi tidak dapat dikenalpasti, sampel akan dirujuk ke Pusat Darah Negara, Kuala Lumpur.
- 3.12 Ujian keserasian darah (GXM)
 - 3.12.1 Darah diperlukan *for life saving (immediate)*
 - i. Unit darah akan segera dibekalkan adalah *Safe O* (un-crossmatched group O Rh (D) positive blood). Bekalan darah akan dibekalkan dalam tempoh ≤ 5 minit.
 - ii. Ujian penuh keserasian (*Full GXM*) akan diteruskan sehingga selesai.
 - iii. Doktor yang merawat akan dimaklumkan sekiranya unit darah yang telah dibekalkan didapati tidak serasi.
 - 3.12.2 Darah diperlukan secara *urgent* (dalam tempoh 30 minit)
 - i. Unit darah yang serasi pada *saline phase crossmatch* akan dibekalkan dalam tempoh ≤ 30 minit.
 - ii. Ujian penuh keserasian (*Full GXM*) akan diteruskan sehingga selesai.
 - iii. Doktor yang merawat akan dimaklumkan sekiranya unit didapati tidak serasi.
 - 3.12.3 Darah diperlukan secara tidak *urgent*

Unit darah yang serasi akan dibekalkan apabila ujian penuh keserasian (*Full GXM*) telah selesai iaitu dalam tempoh masa 2 jam.
 - 3.12.4 Untuk pesakit yang telah mempunyai sampel GSH, Pegawai/ Pakar Perubatan yang merawat pesakit perlu melakukan permohonan untuk *convert* ke GXM dan unit darah akan dibekalkan mengikut keadaan dan keperluan pesakit (rujuk 3.12.1 – 3.12.3)
- 3.13 *Emergency Transfusion*

- 3.13.1 Untuk *lifesaving situation* iaitu darah diperlukan segera untuk menyelamatkan nyawa dan tidak sempat untuk ujian dilakukan walaupun untuk kumpulan darah:
 - i. *Packed cell* ~ akan dibekalkan dengan Safe O (Group O Rh (D) positive)
 - ii. FFP / Cryo ~ akan dibekalkan dengan Group AB
- 3.13.2 *Uncrossmatched Blood* akan dilabel pada unit darah tersebut dan Pegawai Perubatan Pegawai/ Pakar Perubatan yang merawat perlu menandatangani pengambilan unit tersebut untuk mengesahkan *life saving situation*.
- 3.14 Kes-Kes Reaksi Transfusi (*Transfusion Reaction*)
 - 3.14.1 Semua kes-kes yang disyaki berlaku reaksi transfusi (*Transfusion Reaction*) mestilah dilaporkan kepada Pegawai/ Pakar Perubatan Transfusi atas panggilan.
 - 3.14.2 Dapatkan kit *transfusion reaction* dari kaunter Makmal Tranfusi dan sampel untuk penyasatan perlu dihantar ke Makmal Tranfusi bersama-sama borang notifikasi.
 - i. *Post transfusion 1* ~ serta merta
 - ii. *Post transfusion 2* ~ 24 jam kemudian
 - iii. Beg darah berserta *blood giving set* perlu dihantar bersama sampel *post transfusion 1* ke Makmal Tranfusi.
 - 3.14.3 Untuk kes *urticaria* sahaja, Pegawai Perubatan hanya perlu membuat notifikasi kes dengan menghantar borang berkaitan. Tiada sampel diperlukan.
 - 3.14.4 Rujuk '*Transfusion Practice Guidelines for Clinical and Laboratory Personnel, National Blood Centre, Ministry of Health Malaysia, 4th Edition 2016*' yang telah dimuat naik ke Intranet HTF. Boleh juga di muat turun dari laman sesawang www.pdn.gov.my,
 - i. Appendix 18: Request Form for Transfusion Reaction Investigation (Blood and Blood Components) BTS/TR/2/2016 (page: 140)
 - ii. Chapter 13: Adverse Transfusion Reaction (page:69-70)
 - iii. Appendix 19: Worksheet for Investigation of Transfusion Reaction BTS/TRW/2/2016 (page: 142) – For Blood Bank Use
 - iv. Appendix 20: Reporting Form for Transfusion-Related Adverse Event Transfusion Medicine Service, Ministry of Health, Malaysia. BTS/HV/3/2016 (page 143)
 - 3.14.5 Semua laporan *adverse event* dan reaksi transfusi perlu dilaporkan kepada *Hospital Transfusion Committee Meeting* dan *National Haemovigilance Coordinating Centre (NHCC)* secara berkala oleh Unit Transfusi.

4. TATACARA BLOOD ADMINISTRATION / TRANSFUSION

- 4.1 Tujuan:
 - 4.1.1 Untuk memastikan pesakit yang menerima transfusi darah / komponen darah adalah pesakit yang telah dilakukan preskripsi oleh Pegawai/ Pakar Perubatan.
 - 4.1.2 Untuk memastikan darah dan komponen darah yang diberikan untuk rawatan adalah unit yang betul, isipadu yang betul dan pada kadar kelajuan infusi yang bersesuaian serta diberi pada masa yang betul.
"The right patient received the right product with the right indication and right amount at the right rate and right time"
 - 4.1.3 Pakar/ Pegawai Perubatan yang merawat perlu bertanggungjawab dalam memastikan proses transfusi di wad dijalankan mengikut prosedur yang ditetapkan.
- 4.2 Polisi:
 - 4.2.1 Sebelum sesuatu tranfusi dilakukan, pastikan:

- 4.2.1.1 Transfusi telah diarahkan oleh Pegawai/ Pakar Perubatan secara bertulis dan indikasinya didokumenkan.
- 4.2.1.2 Keizinan bertulis untuk transfusi telah diperolehi daripada pesakit / waris kecuali untuk kes kecemasan / *lifesaving situation*.
- 4.2.1.3 Keizinan bertulis untuk transfusi ini hanya boleh diambil dan ditandatangani oleh Pegawai/ Pakar Perubatan.
- 4.2.1.4 Tempoh sah laku keizinan bertulis untuk transfusi adalah selama 28 hari pada satu (1) kemasukan wad. Keizinan perlu diambil bagi setiap kali pendaftaran masuk ke wad.
- 4.2.2 Darah/komponen darah tidak boleh disimpan di wad atau *medication fridge*. Kembalikan unit darah yang tidak digunakan ke makmal transfusi serta merta sekiranya transfusi tidak dapat dilakukan.
- 4.2.3 Pesakit yang akan diberi rawatan transfusi perlu dikenalpasti mengikut tatacara proses transfusi.
- 4.2.4 *Recipient card* (Kad PPDK 1) perlu sentiasa diikat pada unit darah/komponen sepanjang masa transfusi dilakukan.

NOTA:

- i. Transfusi **darah dan semua jenis komponen** adalah menggunakan *blood giving set with integrated filter (170-200µm)* yang berfungsi untuk menapis *large aggregate*.
- ii. Hanya larutan normal saline boleh digunakan untuk *prime the tubing*.
- iii. Tukar *blood giving set* selepas setiap 2 unit darah atau apabila hendak melakukan transfusi platelet.
- iv. Tempoh transfusi
 - a. Setiap unit whole blood / packed cell perlu dimulakan transfusi dalam tempoh 30 minit dikeluarkan daripada *blood fridge* di Makmal Transfusi dan perlu diselesaikan dalam tempoh 4 jam. Hentikan transfusi sekiranya telah mencapai tempoh 4 jam untuk mengelakkan risiko *bacterial contamination* dan lisis.
 - b. Transfusi platelet perlu dilakukan segera dan perlu diselesaikan dalam tempoh 30 minit daripada masa ianya diambil daripada Makmal Transfusi.
 - c. Beg darah yang telah digunakan perlu dikembalikan ke Makmal Transfusi bersama-sama *recipient card*. Pastikan *recipient card* tidak tercemar dengan baki darah/komponen.

4.3 Ringkasan Tatacara Proses Transfusi (Sebelum, Semasa Dan Selepas Transfusi)
Seperti Jadual Dibawah

BIL	LANGKAH		TATACARA	TANGGUNGJAWAB
1	PROSES PENGAMBILAN DARAH DAN MELABEL SPESIMEN DARAH	1.1	Bawa borang Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017), tiub darah (tiub EDTA 6ml) yang kosong bersama BHT pesakit ke katil pesakit yang akan diambil darahnya.	Dr/JT/PPP
	BEDSIDE SAMPLING DAN LABELING	1.2	Kenalpasti pesakit dengan meminta pesakit/keluarga pesakit menyatakan nama penuh berserta Nombor Kad Pengenalan/ Pasport pesakit. Periksa maklumat di pergelangan tangan (<i>wrist band</i>) dan bandingkan dengan butiran di BHT	Dr/JT/PPP

			pesakit.	
		1.3	Selepas sampel darah diambil labelkan spesimen dan borang di katil pesakit (<i>bedside labeling</i>). Jangan biarkan spesimen tidak dilabel walaupun seketika.	Dr/JT /PPP
		1.4	Pastikan maklumat pesakit pada borang permohonan lengkap <ul style="list-style-type: none"> i. Nama penuh ii. Nombor Kad Pengenalan/ Pasport iii. Wad/ Klinik iv. Jenis ujian yang dipohon (GSH/GXM) v. Diagnosis vi. Nama, tandatangan, tarikh, waktu dan cop Pegawai Perubatan yang memohon pada ruangan pengesahan <i>disclaimer</i> (sample darah diambil dan dilabel oleh). vii. Nama, tandatangan, tarikh, waktu dan cop Pegawai Perubatan yang memohon pada ruangan pengesahan bekalan diperlukan. viii. Tandatangan pada ruangan saksi. 	Dr/JT/PPP
		1.5	Label tiub perlu ditulis dan <i>initial</i> . Jangan guna label yang dicetak.	Dr/JT/PPP
		1.6	Pastikan maklumat pesakit di borang dan tiub sama <ul style="list-style-type: none"> i. Nama penuh ii. Nombor Kad Pengenalan/ Pasport iii. Wad/ Klinik iv. Jenis ujian yang dipohon (GSH/GXM) 	Dr/JT/PPP
		1.7	Pastikan Pegawai Perubatan yang memohon ujian memahami perakuan / <i>disclaimer</i> dan menandatangani.	Dr/JT/PPP
		1.8	Proses pengambilan spesimen darah GXM (Bedside sampling and labeling) perlu disaksikan dan disemak semula serta ditandatangani oleh Transfusion Link Nurse/Transfusion Coordinator atau Pegawai/ Pakar Perubatan (Pegawai Perubatan Siswazah tidak dibenarkan menjadi saksi).	Dr/JT/PPP
		1.9	Proses penerimaan ujian mengikut tatacara Penerimaan Dan Penolakan Permohonan Ujian.	Dr/JTMP
2.	ARAHAN UNTUK TRANSFUSI DARAH KENALPASTI	2.1	Pastikan arahan bertulis untuk transfusi tersebut telah didokumenkan di dalam BHT pesakit oleh Pegawai/ Pakar Perubatan. Pegawai Perubatan Siswazah tidak dibenarkan untuk memberikan arahan transfusi.	Dr/JT/PPP

	PESAKIT	2.2	Dokumenkan indikasi transfusi dan jenis darah/komponen darah yang diperlukan di dalam BHT pesakit.	Dr
		2.3	Pastikan keputusan ujian terkini yang berkaitan telah disemak oleh Pegawai/ Pakar Perubatan.	Dr/JT/PPP
		2.4	Pastikan keizinan bertulis (<i>Written Informed Consent</i>) telah dilakukan oleh Pegawai Perubatan (hanya MO/ Pakar Perubatan) dan dipersetujui pesakit. Pastikan ruangan saksi dilengkapkan.	Dr/JT/PPP
		2.5	Pastikan Borang Permohonan Transfusi Darah (borang GXM) di dalam BHT adalah kepunyaan pesakit yang telah diarahkan untuk transfusi.	Dr/JT/PPP
		2.6	Kenal pasti pesakit i. Semak nama penuh pesakit dan Nombor Kad Pengenalan/ Passport di borang GXM dan bandingkan dengan butiran di BHT dan wristband . ii. Pastikan pesakit yang betul dengan meminta pesakit nyatakan nama penuh dan Nombor Kad Pengenalan/ Passport sekiranya pesakit di dalam keadaan sedar. iii. Jangan gunakan nombor katil sebagai pengenalan diri untuk pesakit. iv. Sentiasa pastikan maklumat pengenalan pesakit dengan menyemak butiran pada diri pesakit .	Dr/JT/PPP
		2.7	Pastikan kod permohonan darah GXM diperolehi daripada Pegawai/ Pakar Perubatan Transfusi Atas Panggilan.	Dr
		2.8	Pastikan unit darah telah tersedia untuk diambil dengan menyemak nombor beg darah yang telah ditulis oleh pihak Makmal Tansfusi pada borang GXM dan permohonan masih belum <i>expired</i> (rujuk pada muka surat belakang borang permohonan).	Dr/JT/PPP
		2.9	Isi butiran yang diperlukan pada Borang Pengambilan Darah / Komponen darah (HTF/PL/TM/IH/B-02)	Dr/JT/PPP
3.	PERSEDIAAN PESAKIT DAN SEBELUM PENGAMBILAN DARAH	3.1	Pastikan branula/ 'IV access' telah dipasang dan 'patent'. Disarankan untuk menggunakan branula saiz 16/18G (untuk pesakit dewasa). " <i>Prime</i> " kan dengan larutan normal saline .	Dr/JT/PPP
		3.2	3.2.1 Sebelum mengambil darah di	Dr/JT/PPP

			<p>Makmal Transfusi, periksa dan rekodkan bacaan 5 tanda vital.</p> <ul style="list-style-type: none"> i. Suhu badan ii. Tekanan darah iii. Nadi iv. Kadar pernafasan v. Skala kesakitan <p>Jangan hanya melihat pada bacaan di <i>observation chart</i>.</p> <p>3.2.2 Bacaan tanda vital perlu diambil semula sebelum proses transfusi darah dimulakan.</p>	
		3.3	<p>Untuk pengambilan darah/komponen darah dari Makmal Transfusi, pastikan perkara berikut dibawa bersama:</p> <ul style="list-style-type: none"> i. Borang Salinan Pendua GXM (borang Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017) ii. Borang Pengambilan Darah / Komponen Darah HTF/PL/TM/IH/B-02 yang telah lengkap diisi. iii. Kotak Darah (Blood Box) iv. Pek ais untuk pengambilan Pack cell/whole blood/FFP/Cryo v. Strawboard untuk pengambilan Pack cell/ Whole Blood/ FFP/ Cryoprecipitate vi. Cop (Nama dan Jawatan) vii. Pen berdakwat viii. Memakai sarung tangan getah 	Dr/JT/PPP
4.	MENGAMBIL BEG DARAH DI KAUNTER MAKMAL TRANSFUSI	4.1	Pastikan nama penuh dan Nombor Kad Pengenalan/ Passport/ RN pesakit di Borang Pengambilan Darah / Komponen Darah dan borang GXM adalah sama.	Dr/JT/PPP/MLT
		4.2	<p>Semak butiran pada beg darah dan bandingkan dengan butiran di:</p> <ul style="list-style-type: none"> i. recipient card (PPDK 1) ii. Borang Pendua GXM iii. Borang Pengambilan Darah iv. Rekod Bekalan Darah/Komponen Ke Wad, Unit Transfusi (HTF/PL/TM/IH/WS-04) 	Dr/JT/PPP/MLT
		4.3	<p>Semak butiran berikut di dalam dokumen yang dinyatakan di 4.2:</p> <ul style="list-style-type: none"> i. Nama penuh pesakit ii. Nombor Kad Pengenalan/ Passport/ RN iii. Kumpulan darah pesakit (ABO & Rh) 	Dr/JT/PPP/MLT

			iv. Kumpulan darah pada beg darah (ABO & Rh) v. Nombor beg darah/komponen vi. Jenis darah/komponen vii. Tarikh luput (<i>expiry date</i>) viii. Keputusan ujian keserasian	
		4.4	Periksa beg darah: i. <i>clots</i> ii. Perubahan warna iii. Kebocoran daripada beg darah	Dr/JT/PPP/MLT
		4.5	Sahkan penerimaan pada Borang Rekod Bekalan Darah/komponen Ke Wad, Unit Transfusi (HTF/PL/TM/IH/WS-04)	Dr/JT/PPP/MLT
5.	KETIBAAN BEG DARAH KE WAD	5.1	Maklumkan segera kepada Jururawat atau Dr yang menjaga pesakit tersebut dan tandatangan pada ruang <i>Blood – Chain Of Custody</i> di bahagian belakang borang GXM. (Bahagian ini akan dicop oleh MLT bertugas di Makmal Transfusi apabila beg darah dibekalkan)	Dr/JT/PPP
		5.2	Pegawai yang menjaga pesakit perlu sahkan penerimaan beg darah tersebut di wad dengan menandatangani pada ruang ‘penerima’ untuk <i>Blood – Chain Of Custody</i> dan mengambil tindakan segera melakukan ‘bedside checking’ untuk memastikan transfusi dapat segera dilakukan.	Dr/JT/PPP

		5.3	<p>Pemulangan darah/ komponen darah yang tidak digunakan selepas diambil</p> <ul style="list-style-type: none"> i. Maklumkan kepada Pegawai/ Pakar Perubatan Transfusi Atas Panggilan ii. Darah/komponen darah perlu dipulangkan dengan kadar segera ke Makmal Transfusi selepas dimaklumkan iii. Pegawai/ Pakar Perubatan yang merawat perlu mengisi Borang Pemulangan Semula Darah / Komponen Darah (HTF-PL/TM/IH/B-03) iv. Darah yang dipulangkan akan disemak jangka masa dan suhu ketika pemulangan. Darah yang dipulangkan melebihi 30 minit atau tidak menepati suhu yang ditetapkan (2- 10C) akan dilupuskan. v. Semua komponen darah yang dipulangkan akan dilupuskan. 	Dr/JT/PPP/JTMP
6.	PEMERIKSAAN PENGESAHAN PESAKIT (BEDSIDE CHECKING)	6.1	Mesti dilakukan oleh dua orang anggota secara serentak iaitu seorang JT/PPP dan seorang doktor atau 2 orang doktor (tidak dibenarkan kedua-duanya Pegawai Perubatan Siswazah).	Dr/JT/PPP
		6.2	Mesti dilakukan di tepi katil pesakit (dengan kehadiran pesakit).	Dr/JT/PPP
		6.3	Minta pesakit menyebut nama penuh dan Nombor Kad Pengenalan/ Passport mereka dan semak semula dengan <i>wristband</i> . Untuk pesakit tidak sedar atau tidak boleh bercakap, gunakan identiti yang ditulis pada <i>wristband</i> .	Dr/JT/PPP
		6.4	<p>6.4.1 Semak dan sahkan semula nama penuh dan Nombor Kad Pengenalan/ Passport yang telah disebut oleh pesakit dengan:</p> <ul style="list-style-type: none"> i. Wristband (gelang nama) ii. BHT iii. Kad PPDK 1 iv. borang GXM <p>6.4.2 Jangan gunakan nombor katil sebagai pengenalan diri untuk pesakit.</p> <p>6.4.3 Sentiasa pastikan pengenalan pesakit dengan menyemak butiran pada diri pesakit.</p>	Dr/JT/PPP

		6.5	Pastikan butiran pada bag darah, kad PPDK 1 & borang GXM adalah sama untuk: i. Nama pesakit ii. Nombor kad pengenalan pesakit iii. Kumpulan darah pada beg darah (ABO & Rh) iv. Jenis kumpulan darah pesakit (ABO & Rh) v. Nombor bag darah vi. Jenis produk darah vii. Keputusan Ujian Keserasian viii. Tarikh luput (<i>expiry date</i>)	Dr/JT/PPP
		6.6	Sahkan dan tandatangan pada ruang <i>pre-transfusion bedside checking</i> pada bahagian hadapan kad PPDK 1 sebelum transfusi dimulakan.	Dr/JT/PPP
		6.7	Jangan mulakan transfusi sekiranya terdapat kekeliruan. Sekiranya terdapat kekeliruan, maklumkan kepada Pegawai/Pakar Perubatan Transfusi Atas Panggilan.	Dr/JT/PPP
7	MEMULAKAN PROSES PEMINDAHAN DARAH/ KOMPONEN DARAH (TRANSFUSI)	7.1	7.1.1 Transfusi Whole Blood dan Packed Cell perlu dimulakan segera dalam tempoh 30 minit darah dikeluarkan daripada peti sejuk Makmal Transfusi. 7.1.2 Untuk platelet , FFP dan cryoprecipitate transfusi perlu dilakukan dalam kadar segera .	Dr/JT/PPP
		7.2	Isikan semua maklumat di dalam borang <i>Check List For The Transfusion Practice</i> (JT-BK-021) : i. Sebelum memulakan proses transfusi ii. Semasa proses transfusi iii. Setelah transfusi	Dr/JT/PPP
		7.3	Semak semula: i. Arahan bertulis untuk transfusi ii. Indikasi untuk transfusi dinyatakan iii. 'informed consent' telah ditandatangani	Dr/JT/PPP
		7.4	Jelaskan prosedur kepada pesakit.	Dr/JT/PPP

		7.5	Rekodkan tanda vital sebelum transfusi dimulakan: i. Suhu badan pesakit ii. Tekanan darah iii. Nadi iv. Kadar pernafasan v. <i>pain score</i>	Dr/JT/PPP
		7.6	Lakukan auskultasi paru-paru pada semua pesakit yang berisiko untuk <i>overload</i> (contoh orang tua, <i>Cardiac Overload</i> dan sebagainya) sebelum transfusi dijalankan dan rekodkan ke dalam BHT pesakit.	Dr/JT/PPP
8	MEMULAKAN ALIRAN DARAH (<i>SPIKING THE BLOOD</i>)	8.1	Sebelum set pemindahan darah disambungkan ke beg darah, periksa semula beg darah untuk: i. <i>Blood clot</i> ii. Perubahan warna iii. Kebocoran daripada beg darah	Dr/JT/PPP
		8.2	Terbalikkan beg darah beberapa kali dengan perlahan-lahan.	
		8.3	<i>Spike</i> darah mengikut aturan berikut: i. Buka penutup <i>port</i> pada beg darah. ii. Pegang beg darah menggunakan sebelah tangan dan <i>tubing spike</i> pada sebelah tangan lagi iii. Masukkan <i>tubing spike</i> ke dalam <i>port</i> beg darah secara perlahan.	
		8.4	Jangan lakukan sambungan set transfusi darah ke beg darah dengan menggantung beg darah pada <i>drip stand</i> .	
		8.5	Jangan <i>overspike</i> untuk mengelakkan kebocoran pada beg darah.	
		8.6	Maklumkan kepada pesakit supaya memberitahu petugas di wad sekiranya mengalami sebarang gejala ketika proses transfusi.	
9	KETIKA TRANSFUSI	9.1	Pastikan kad PPDK 1 sentiasa diikat pada beg darah sepanjang tempoh tranfusi.	Dr/JT/PPP
		9.2	Mulakan transfusi pada kadar perlahan (20 <i>drops/min</i>) untuk 15 minit yang pertama dan lakukan pemerhatian yang rapi ke atas pesakit untuk sebarang reaksi awal.	
		9.3	Ulangi pemeriksaan tanda vital selepas 15 minit, 30 minit dan setiap satu jam berikutnya dan rekodkan. Pengawasan yang lebih kerap perlu dilakukan ke atas pesakit yang berisiko mendapatkan <i>circulatory overload</i> , pesakit yang pernah mengalami reaksi transfusi sebelumnya dan yang antibodi.	

10	PENGURUSAN REAKSI TRANSFUSI	9.4	Tingkatkan kelajuan transfusi mengikut kadar yang ditetapkan jika tiada sebarang reaksi berlaku.	
		9.5	Perhatikan sebarang gejala atau tanda reaksi transfusi.	
		10.1	Hentikan transfusi segera dan maklumkan kepada Pegawai/ Pakar Perubatan yang merawat pesakit. Jangan alirkan baki darah di dalam tiub kepada pesakit.	Dr/JT/PPP
		10.2	Kekalkan branula. Tukarkan set tiub yang baru. Gunakan larutan <i>normal saline</i> untuk memastikan aliran intravena terus berfungsi.	
		10.3	Lakukan pemeriksaan tanda vital dan berikan rawatan kepada pesakit mengikut gejala dan jenis reaksi.	Dr/JT/PPP
		10.4	Semak dan sahkan semula nama penuh dan Nombor Kad Pengenalan/ Pasport pesakit dengan: <ul style="list-style-type: none"> i. Wristband (gelang nama) ii. BHT iii. Borang GXM iv. Kad PPDK 1 	
		10.5	Semak semula butiran pada bag darah, kad PPDK 1 & borang GXM adalah sama untuk: <ul style="list-style-type: none"> i. Nama pesakit ii. Nombor Kad Pengenalan/ Pasport pesakit iii. Kumpulan darah pada beg darah (ABO & Rh) iv. Jenis kumpulan darah pesakit (ABO & Rh) v. Nombor bag darah vi. Jenis produk darah vii. Keputusan Ujian Keserasian viii. Tarikh luput (<i>expiry date</i>) 	
		10.6	Maklumkan kepada Pegawai / Pakar Perubatan transfusi Atas Panggilan. JTMP Makmal Transfusi akan membekalkan kit <i>transfusion reaction</i> sekiranya perlu.	Dr/JT/PPP/JTMP
		10.7	10.7.1 Lakukan notifikasi dengan mengisi borang seperti yang dibekalkan di dalam Kit <i>Transfusion Reaction</i> : <ul style="list-style-type: none"> i. Request Form for Transfusion Reaction Investigation (Blood and Blood Components) BTS/TR/2/2016 ii. Reporting Form for Transfusion-Related Adverse Event Transfusion Medicine Service, Ministry of Health, 	

			Malaysia. BTS/HV/3/2016	
			10.7.2 Hantar beg darah dan set tiub bersama <i>Post transfusion sample</i> 1.	
			10.7.3 Hantar sampel untuk penyiasatan reaksi transfusi ke Makmal Transfusi: i. <i>Post transfusion sample</i> 1 (serta-merta) ii. <i>Post transfusion sample</i> 2 (selepas 24 jam)	
		10.8	Rekodkan reaksi transfusi dan rawatan yang diberikan ke dalam BHT pesakit.	
11	TRANSFUSI SELESAI	11.1	Selesaikan transfusi dalam jangka masa berikut: i. Whole Blood/ Pack cell – dalam tempoh 4 jam daripada dikeluarkan dari peti sejuk Makmal Transfusi ii. Platelet, FFP dan cryoprecipitate - diselesaikan dalam tempoh dalam tempoh 30 minit atau mengikut tahap toleransi pesakit terhadap transfusi	Dr/JT/PPP
		11.2	Hentikan transfusi sekiranya melebihi tempoh yang ditetapkan.	Dr/JT/PPP
		11.3	11.3.1 Kekalkan branula pada pesakit. Sekiranya masih terdapat transfusi darah yang seterusnya, gunakan set transfusi yang baru selepas setiap pemberian 2 unit/beg darah atau apabila hendak melakukan transfusi platelet. 11.3.2 Sekiranya tiada transfusi darah yang seterusnya, tukar kepada set tiub yang baru untuk pemberian cecair intravena.	Dr/JT/PPP
		11.4	Lakukan pemeriksaan tanda vital dan rekodkan. Reaksi transfusi akut masih boleh berlaku dalam tempoh 24 jam.	Dr/JT/PPP
		11.5	Lengkapkan kad PPDK1 dan tandatangan.	Dr/JT/PPP
		11.6	Tatacara penghantaran beg darah ke Makmal Transfusi i. Masukkan beg darah yang telah digunakan tadi ke dalam plastik kuning TANPA sambungan set pemindahan darah. ii. Masukkan kad PPDK 1 di dalam plastik spesimen (pastikan tidak dicemari darah). dan dikembalikan	Dr/JT/PPP

			<p>ke Makmal Transfusi bersama-sama kad PPDK 1.</p> <p>iii. Ikat plastik kuning dengan kemas</p> <p>iv. Masukkan plastik kuning berisi beg darah ke dalam tong kuning yang disediakan di Makmal Transfusi.</p>	
12	DOKUMENTASI	12.1	<p>Rekodkan butiran untuk setiap transfusi ke dalam BHT pesakit:</p> <p>i. Tarikh transfusi</p> <p>ii. Masa transfusi dimulakan dan masa selesai</p> <p>iii. Nombor beg darah</p> <p>iv. Jenis produk dan isipadu</p> <p>v. Nama pegawai yang melakukan <i>pre-transfusion bedside cheking</i></p> <p>vi. Reaksi transfusi sekiranya ada</p>	Dr/JT/PPP

TEMPOH PENGELUARAN KEPUTUSAN SELEPAS PENERIMAAN SPESIMEN
Makmal Unit Transfusi
Hospital Tuanku Fauziah

Bil	Ujian	TAT
1	ABO/Rh grouping	≤ 4 hr
2	Group Screen and Hold (GSH)	≤ 4 hr
3	Crossmatching (GXM) of Packed Cell or Whole Blood:	
	a. Full GXM	≤ 2hr
	b. Saline phase	Within (≤) 30minutes
	c. Safe O	Within (≤) 5minutes
4	Antibody Screening Test	≤ 4 hr
5	Antibody Identification:	
	a. Internal (HTF) – full written report	≤ 1 week
	b. Referral Laboratory (PDN) – full written report	≤ 1 month
6	Red Cell Phenotyping – full written report	≤ 1 week
7	Coomb's Test (Direct/Indirect)	≤ 24 hr
8	Transfusion reaction investigations – full written report	≤ 14 days
9	Supply of blood component/s:	
	a. Platelet	within (≤) 5minutes
	b. Fresh Frozen Plasma & Cryoprecipitate	within (≤) 30minutes

MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE (MSBOS) **HOSPITAL TUANKU FAUZIAH, KANGAR PERLIS** **(DECEMBER 2020)**

Introduction:

1. This schedule is a reference used to guide clinicians in ordering blood before surgery.
2. The MSBOS is a table of elective surgical procedures which lists the number of units of blood routinely requested, and cross-matched for them pre-operatively.
3. The schedule is based on retrospective analysis of actual blood usage associated with the individual surgical procedure.
4. An important factor that can be considered in the establishment of an MSBOS is the identification of those procedures that can be accommodated performed.
5. For cases where blood is less likely to be transfused, a Group Screen and Hold (**GSH**) is performed.
6. For cases where blood is likely to be transfused, a full cross-match (**GXM**) is done.
7. However, when antibody screening is positive, compatible blood must be made available in all cases before surgery.

Developing MSBOS:

1. Data on blood request for all procedures for 6months is analysed.
2. For each procedure, indicate the number of units cross-matched and the number of units transfused.
3. Calculate the percentage of blood usage:

$$\frac{\text{Total Number of Units Transfused}}{\text{Total Number of Units Cross-matched}} \times 100 = \text{-----} \%$$

4. In procedures where blood usage is **less than 30%**, GSH are performed.
5. Other procedures are allotted a tariff based on the average number of blood transfused.
6. Example:

Procedure	No. of operations	Units of blood cross-matched	Units of blood transfused	% of units transfused	Remarks
Caesarian Section	60	120	8	6.6%	< 30%
Total Hip Replacement	20	60	40	66%	> 30%

7. In the above example, for Caesarian Section, GSH is performed, while in Total Hip Replacement, a full GXM is performed. The number of units cross-matched is based on the average number of units transfused.
8. In drawing up the schedule, local factors such as expertise available in the hospital and the speed of provision of compatible blood have to be taken into account.

Implementation:

1. MSBOS should be explained to all doctors in the hospitals and the best way is through the Transfusion Committee.
2. Once the draft schedule has been constructed, it should be circulated and discussed.
3. Flexibility should be allowed for individual cases eg. Placenta praevia.
4. When all heads of department have agreed on a schedule, it should be circulated and implemented.
5. Regular monitoring is necessary to detect any problems and for 'fine tuning' of the schedule if necessary.
6. Confidence in the operation of MSBOS and compliance by users depend on the laboratory being able to provide compatible blood whenever it is required, including urgent requests.
7. This is dependent on the following 5 factors:
 - a. Pre-operative blood samples must be obtained from all patients: whether GSH or GXM categories. Laboratories will set their time limits on the latest time the samples should be submitted before the date of surgery. This is to ensure ample time is allocated for the GSH and GXM of blood. If an irregular antibody is detected, this may delay the provision of compatible blood and the consultant must be informed.
 - b. Serum saved for GXM must be accurately labelled and readily accessible.
 - c. Procedures must be clearly defined to enable blood transfusion staff to provide compatible blood safely should an emergency occur during a GSH operation.
 - d. Communication between the operating theatre and the blood transfusion laboratory must be clearly defined.
 - e. Transporting blood between the laboratory and the operating theatre must have an established priority.

Serological Techniques:

1. Blood samples from all patients must have a full ABO and RhD grouping and antibody screening done.
2. For GSH category, the serum is kept for 72hours, except for placenta praevia cases.
3. Where antibody screen is positive, antibody identification must be performed and compatible blood GXM before surgery is performed.
4. If blood is required urgently, blood of the same ABO and RhD can be given. After been issued, the laboratory would continue to do a full GXM.
5. If any incompatibility is detected, the patient's doctor must be informed immediately.

**MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE (MSBOS)
HOSPITAL TUANKU FAUZIAH, KANGAR PERLIS
(DECEMBER 2020)**

(1) SURGERY:

1a. GENERAL SURGERY

Bil	Procedure	MSBOS
1	Hemithyroidectomy	GSH
2	Total thyroidectomy	GSH
3	Mastectomy	GSH
4	Colostomy	GSH
5	Abdominal perineal resection	GXM
6	Double bypass	GXM
7	Right hemicolectomy	GSH
8	Left hemicolectomy	GSH
9	Sigmoid colectomy	GSH
10	Anterior resection	GXM
11	Ultralow anterior resection	GXM
12	Partial gastrectomy	GXM
13	Total gastrectomy	GXM
14	Perforated gastric ulcer / duodenal repair	GSH
15	Small bowel surgery / obstruction	GSH
16	Open cholecystectomy	GSH
17	Lap cholecystectomy	GSH
18	Whipple's operation	GXM
19	Splenectomy	GXM
20	Liver trauma	GXM
21	Herniorrhaphy	GSH
22	Herniotomy	GSH

1b. UROLOGY

Bil	Procedure	MSBOS
1	TURP	GSH
2	TURBT	GSH

(2) ORTHOPAEDIC:

2a. ARTHROPLASTY

Bil	Procedure	MSBOS
1	Total knee replacement	2 units
2	Bilateral knee replacement	2 units
3	Revision total knee replacement	2 units
4	Hemiarthroplasty	2 units
5	Total hip replacement	2 units

2b. SPINE

Bil	Procedure	MSBOS
1	Anterior spinal decompression and instrumentation / fusion	2 units
2	Posterior spinal decompression (discectomy, laminotomy)	2 units
3	Scoliosis surgery	2 units

2c. TRAUMA: Open reduction internal fixation

Bil	Procedure	MSBOS
1	Femur	GSH
2	Humerus	GSH
3	Pelvic trauma	GSH
4	Tibia / fibula	GSH
5	Radius / ulna	GSH
6	Foot / ankle	GSH
7	Hip	GSH
8	Shoulder	GSH
9	Wound debridement	GSH
10	Hand / foot amputation	GSH
11	Transtibial amputation	1 unit
12	Transfemoral amputation	2 units
13	Hip / shoulder disarticulation	2 units
14	Transhumeral amputation	1 unit
15	Elbow / knee	GSH

2d. PAEDIATRIC

Bil	Procedure	MSBOS
1	Pelvic osteotomy	2 units
2	Femoral osteotomy	2 units
3	Open reduction hip	2 units
4	Corrective osteotomy (around the knee)	2 units

(3) OBSTETRIC & GYNAECOLOGY:**3a. ELECTIVE LSCS (Low Risk of Bleeding)**

Bil	Procedure	MSBOS
1	Elective LSCS (Low risk of bleeding)	GSH

3b. ELECTIVE LSCS (High Risk of Bleeding)

Bil	Procedure	MSBOS
1	Placenta praevia (any degree)	2 units
2	Abruption placenta	2 units
3	Polyhydramnios	GSH
4	Multiple pregnancy	GSH
5	Grand multiparity	GSH
6	Maternal anaemia Hb < 10g/dl	1 unit
7	Presence of bleeding disorder eg: liver disease, uremia, coagulation abnormality	1 unit
8	Uterine rupture	2 units

3c. POST PARTUM HAEMORRHAGE

Bil	Procedure	MSBOS
1	Uterine atony	2 units
2	Retained placenta	GSH
3	Genital tract trauma	GSH
4	Manual removal of placenta	GSH

3d. GYNAECOLOGY OPERATION

Bil	Procedure	MSBOS
1	ERPOC, EUA, DD & C (only if Hb <10.0 g/dL)	GSH
2	Suction curettage for molar pregnancy (uterus size > 14/52)	1 unit
3	Suction curettage for molar pregnancy (uterus size < 14/52)	GSH
4	TAHBSO for benign disorder	GSH
5	TAHBSO for malignant disease	GSH
6	Myomectomy (uterus size < 20/52)	GSH
7	Myomectomy (uterus size > 20/52)	2 units
8	Stable ectopic pregnancy	GSH
9	Ruptured ectopic pregnancy	2 units
10	Vaginal hysterectomy	GSH
11	BTL / cystectomy (only if Hb <10.0 g/dL)	GSH
12	Diagnostic laparoscopy (only if Hb <10.0 g/dL)	GSH
13	Twisted ovarian cyst	GSH
14	Incomplete abortion (only if Hb <10.0 g/dL)	GSH
15	Cone biopsy / LLETZ (only if Hb <10.0 g/dL)	GSH

(4) ENT:**4a. EAR**

Bil	Procedure	MSBOS
1	Myringectomy +/- grommet insertion	Nil
2	Examination under microscopy +/- foreign body removal	Nil
3	Mastoid surgery	Nil
4	Preauricular sinus excision	Nil
5	Canalplasty	Nil
6	Facial nerve decompression	Nil

4b. NOSE

Bil	Procedure	MSBOS
1	Examination under anaesthesia +/- foreign body removal	Nil
2	Septoplasty +/- turbinoplasty	Nil
3	Functional Endoscopic Sinus Surgery (FESS)	GSH
4	Endoscopic medial maxillectomy	GSH
5	Total maxillectomy	2 units
6	Endoscopic Dacrocystorhinostomy	GSH
7	External approach ethmoidectomy / maxillectomy	GSH
8	Nasal bone reduction	Nil
9	Septorhinoplasty	GSH
10	Endoscopic Sphenopalatine Artery Ligation (ESPAL)	GSH

4c. THROAT, HEAD AND NECK PROCEDURES

Bil	Procedure	MSBOS
1	Tonsillectomy +/- adenoidectomy	GSH
2	Frenotomy	Nil
3	Excision of lymph nodes	Nil

4	Branchial cyst excision	Nil
5	Sistrunk surgery	Nil
6	Tracheostomy	Nil
7	Neck dissection	GSH
8	Parotidectomy	GSH
9	Total laryngectomy +/- thyroidectomy	GSH
10	Submandibulectomy	GSH
11	Glossectomy	2 units
12	Flap reconstruction	2 units
13	Neck exploration	GSH / GXM
14	Thyroidectomy	GSH
15	Sialendoscopy / marsupialization of duct	Nil
16	OSA surgery (uvulopalatal flap +/- lateral pharyngopasty +/- CAPSO)	GSH

4d. LARYNX

Bil	Procedure	MSBOS
1	Direct laryngoscope +/- biopsy	Nil
2	Oesophagoscope +/- foreign body removal	Nil
3	Bronchoscopy +/- dilatation +/- lavage +/- foreign body removal	Nil
4	Tracheal stenting	Nil
5	Supraglottoplasty	Nil

MASSIVE TRANSFUSION PROTOCOL (MTP)

HOSPITAL TUANKU FAUZIAH

1. INTRODUCTION

- a. This section discusses local adaptation of the MTP template, and development of guidelines on activation and cessation of the MTP
- b. Local adaptation:
 - i. A multidisciplinary team should adapt the MTP template to:
 1. Incorporate the recommendations and practice points provided in this module
 2. Take into account local resources (e.g. access to blood components)
 3. Provide details of how components will be delivered to the correct patient and location
 4. Include supporting information that explains how the clinical, laboratory and support staff will communicate
 5. Highlight the need for early communication with a transfusion specialist or haematologist.
 - ii. The MTP template can also be modified for specific populations such as obstetric patients, given the potential for concealed haemorrhage and early development of disseminated intravascular coagulation.
 - iii. The local facility should also develop materials to accompany the MTP, clarifying the roles and responsibilities of the team members.
- c. Massive hemorrhage can be seen in different clinical setting:
 - i. Multiple trauma
 - ii. Obstetric emergencies
 - iii. Industrial accidents
 - iv. Penetrating injuries
 - v. GI bleeding

2. DEFINITION

MASSIVE BLOOD LOSS

- i. Loss of one (1) blood volume within 24hour (BV is approximately 70mls/kg)
 - ii. Loss of 50% blood volume within 3hour
 - iii. Loss of blood at the rate of 150ml/min
- (D. Stainsby, et al. British Journal of Hematology.2006; 135, 634-641)

MASSIVE TRANSFUSION

- i. Replacement of 1blood volume within 24hour
- ii. Replacement of 50% blood volume within 1hour

3. WHY IMPLEMENT MTP

- i. To improve clinical outcomes
 - mortality decreased with MTP introduction from 49% to 19%
(Riskin D.J Am Coll Surg 2009;209:198)
- ii. Ensure frequent laboratory monitoring
- iii. Minimize:
 - delays in access to appropriate blood products
 - delays of sufficient quantities

iv. Improves communication

4. AIM/GOAL OF MTP

- i. Prevent/minimize coagulopathy
- ii. Avoid unnecessary/wastage transfusion
- iii. Minimize end organ dysfunction

5. TRIGGER LEVEL FOR MTP ACTIVATION

- **On-going uncontrolled bleeding &? the need of massive transfusion:**
 - ? Based on ABC Score
 - ? Based on Massive blood loss definition

Decision can only be made by clinical specialist / registrar in-charge

6. WHO SHOULD ACTIVATE MTP

- MTP can only be activated by specialist/registra and should be co-ordinated by medical officer in-charge.
- The decision to activate the MTP is only privileged to clinical specialist/registra to make sure patients are carefully & accurately selected.
- Once MTP is activated by specialist/registra, the co-ordinator should contact Blood Bank Medical Officer (MO) on-call to inform regarding MTP activation & for further action.
- Blood bank MO on-call will inform lab staff for further action, to inform transfusion specialist / hematologist on-call and to activate HSB/PDWU M.O Blood bank on-call

7. CONTACT PERSON

- i) Hospital Tuanku Fauziah
 - a. Blood Transfusion Laboratory **Ext 8201**
 - b. M.O / Specialist oncall (via operator)

8. INFORMATION NEEDED BY THE TRANSFUSION LABORATORY (BB MO ON-CALL)

- i) Massive Transfusion Protocol been **activated** & the name of contact person
- ii) Patient identification – Name, sex, Identity number (IC/Passport), A&E number, location
 - Unknown if identity is not available
- iii) Name & contact details of person activating protocol for ongoing communication
- iv) Cause of bleeding
- v) How urgently (in minutes) until blood is needed at the bedside
- vi) GXM, Full Blood Count & coagulation screening samples being sent

9. THE BLOOD TRANSFUSION LABORATORY WILL ISSUE

- i) Package #1:
 - 2 units Safe 'O' immediately, OR 2 units of group specific (saline-phase crossmatched) blood – if valid sample is available
- ii) Package #2 (1:1 ratio): Once Package # 1 is collected from the laboratory:
 - a. A further 2 units of group specific (full crossmatched) blood and 2 units of FFP will automatically be prepared and made available for issue.
- iii) Package #3 (1:1ratio): Once Package #2 is collected from the laboratory:
 - a. A further 2 units of group specific (full crossmatched) blood and 2 units of FFP will automatically be prepared and made available for issue.

- iv) Package #4: At this stage, if still bleeding (1:1:1 ratio):
- 2 units of group specific (full crossmatched) blood
 - 2 units of FFP
 - 1 adult therapeutic dose platelets (4 units of random platelets OR 1 unit of apheresis platelet)
 - Cryoprecipitate if necessary (Dose: 1 unit per 10kg of patient's body weight)
- *For paediatric cases, the dose/volume of every blood and blood components will be calculated according to the patient's estimated body weight***

v) THE LABORATORY WILL CONTINUE TO PREPARE 2 UNITS OF BLOOD & 2 UNITS FFP AT A TIME WHILST THE PATIENT IS BLEEDING

- The supply of platelets & cryoprecipitate will depend on the patient's clinical symptoms, lab investigation results and also the availability of the platelet.

vi) ENSURE THE PORTER (SN/HO) IS SENT TO COLLECT BLOOD AND BLOOD COMPONENTS

8. AVAILABILITY OF BLOOD FOR COLLECTION

- Emergency/ safe 'O' Blood – immediate
- Group specific blood – within 30 minutes
- Crossmatched blood – 45 minutes
- Fresh Frozen Plasma (FFP) – 30 minutes to thaw
- Cryoprecipitate – 30 minutes to thaw
- Platelets – immediate if onsite. Replacement delivery up to 2 hours (delivery from PDWU/HSB Alor Star, Kedah)

9. THE CLINICAL AREA WILL:

- Nominate a **blood coordinator** to ensure blood & blood components are managed effectively
- To inform Blood Bank Medical Officer on-call regarding the activation of MTP
- Send GXM request form & sample to the Blood Bank Lab for the preparation of next MTP package
- To write down 'MTP' on top of the GXM request form
- Send full blood count (FBC) and coagulation screen samples (PT/APTT/INR) as a baseline
- Call for emergency porter (SN / HO)
- Ensure the patient's consultant has been informed
- Inform the Blood Bank MO on-call of the patient outcome, destination if moved and when to call off MTP.
- Aim for & maintain:

<u>Bil</u>	<u>Parameter</u>	<u>Aim</u>
1	Temperature	> 35°C
2	pH	>7.2
3	Base Excess	< -6
4	Lactate	< 4mmol/L
5	Calcium	>1.1mmol/L
6	Platelets	>50x10 ⁹ /L
7	PT/APTT	<1.5 x normal
8	INR	<1.5
9	Fibrinogen	>1.0g/L

10. ACTIVATION AND CESSATION OF MTP

The multidisciplinary team should also develop guidelines for the **activation and cessation of the MTP**. This will help to ensure that the MTP is used appropriately, and **wastage of blood components is minimised**.

Activation of the MTP should take into account:

- cause and rate of the haemorrhage
- mechanism of injury (if present)
- current physiological state
- likely requirement for ongoing blood component support.

Once definitive control of bleeding has been achieved, a restrictive approach to blood product transfusion is preferred because of the well-known risks and negative outcomes of transfusion.

The guidelines on **activation and cessation** of the MTP should be clearly communicated to all relevant staff.

11. MTP AUDIT AT HOSPITAL LEVEL (E.G. HOSPITAL TRANSFUSION COMMITTEE)

- Use of the MTP should be audited and revised if necessary.

12. NOTIFICATION OF MTP CASE WITH TRANSFUSION REACTION.

- To send for transfusion reaction investigations & notification forms.

13. MTP WORKFLOW: Refer attachment below

MASSIVE TRANSFUSION PROTOCOL
HOSPITAL TUANKU FAUZIAH, KANGAR PERLIS
(1 January 2015, Version 1)

TRAUMA / MASSIVE BLOOD LOSS CASE

MASSIVE TRANSFUSION
REQUIRED?

NO

CONTINUE
SECONDARY SURVEY

YES

CLINICAL TEAM:

1. Activate MTP (By Registrar/specialist) & Nominate blood coordinator
2. Notify Blood Bank MO on-call
3. SEND BLOOD SAMPLES: GXM, Full Blood Count & coagulation screening
4. Co-ordinate regular monitoring & communication of results
5. Should ensure the follow up blood and blood components are managed effectively
6. Ensure proper passing over to the next management team
7. Call for emergency porter (SN/HO)

TRANSFUSION TEAM (BLOOD BANK):

Package #1: 2units Safe 'O' **OR**
2units group specific blood (saline phase)

Package #2: 2 units (full crossmatched) blood
2units FFP

1:1 ratio

Package #3: 2 units (full crossmatched) blood
2 units FFP

1:1 ratio

Package #4:

- 2 units crossmatched blood
- 2 units FFP
- 1 adult therapeutic dose platelets (4 units random / 1unit apheresis)
- Cryoprecipitate if necessary (Dose: 1unit/10kg body weight)

1:1:1 ratio

Cycle
continues
until
termination of
MTP

****For paediatric cases, the dose/volume of every blood and blood components will be calculated according to the patient's estimated body weight****

Hemostasis &
coagulopathy resolved?

NO

1. Clinical re-assessment
2. Repeat lab investigations
3. MTP cycle continues

YES

STOP MTP:

- Clinical team to notify BB to stop MTP & return unused blood ASAP
- Resume standard orders

UNIT HISTOSITOPATOLOGI

GENERAL POLICY OF THE HISTOCYTOPATHOLOGY UNIT: DELIVERY OF TISSUE FOR HISTOPATHOLOGICAL / SITOLOGICAL EXAMINATION

1. Generally, cases requiring a Histopatological diagnosis the tissue or organ removed from the body through surgery or other procedures shall be sent in whole to the Department of Pathology, Tuanku Fauziah Hospital. The exceptions to the above are:
 - A. Limb cutting (amputation) for tumours that have been diagnosed, only partial/whole tumors and surgical margins should be examined.
2. Cases such as recurrent tumour are required to be sent for Histopatological testing even if a diagnosis has been done before.
3. Frozen Section services are not available in the Pathology Laboratory, HTF. The specialists who requiring such services should discuss with pathologists on service needs and the possibility of referring patients to hospitals that provide such services.
(Perkhidmatan “Frozen Section” tidak disediakan di makmal Patologi, HTF. Pakar perubatan yang memerlukan perkhidmatan tersebut perlu berbincang dengan pakar patologi anatomik tentang keperluan perkhidmatan dan kemungkinan merujuk pesakit ke hospital yang memberi perkhidmatan tersebut.)

HISTOPATHOLOGY LABORATORY HANDBOOK

1. List of Service

- a. General Histopathological Examination of tissue (routine HPE)
- b. Histochemistry (Special Stain)
- c. Immunohistochemistry (IHC)
- d. Clinical Autopsy

2. Service Hour

a. Laboratory:

- i. Monday to Friday: 8.00am-5.00pm (Reception of specimen until 4.00pm only).
Closed: Saturday, Sunday and Public holiday

b. Clinical Autopsy:

- i. 24 hour service
- ii. A histopathologist is rostered for 24 hours call to cater for clinical autopsy as well as surgical pathology consultation. He/she can be contacted through the hospital operator.

3. Contact Number

- a. Pathologist Room: 8188
- b. Histopathology Laboratory: 8186

4. Request Form

a. General (routine) Histopathology

- i. Use PER-PAT 301 request form filled in with relevant clinical information for all histopathological examination requests. If the report is needed urgently, please mark the request form URGENT clearly at the top right-hand corner.
- ii. Histopathology Laboratory requires only 1 copy of request form for each case. A request with multiple specimens from a patient only requires one copy of request form.
- iii. All request form should be filled legibly, complete with relevant clinical history and finding and must have at least below:
 1. Name of the patient
 2. Patient identity card (I/C) number or/and hospital register number (RN) or/and any unique identity number
 3. Gender
 4. Age

5. Ward/Clinic
6. Test requested
7. Time and date specimen taken
- iv. The clinician should have his/her name, designation and department clearly written on the request form.
- v. Rejection criteria is listed in **appendix 12**
- b. Clinical Autopsy
 - i. Clinical Autopsy or postmortem examination is conducted to ascertain the cause of death in non-medicolegal cases. This service is only provided for patients who died in Hospital Tuanku Fauziah.
 - ii. The policy and procedure for clinical autopsy is under the responsibility of Forensic Unit. Please refer to relevant document and person in charge of Forensic Unit.
 - iii. In summary, the following procedure is as below:
 1. The requesting doctor shall first obtain written consent from the next of kin.
 2. The clinician who requested for post-mortem shall communicate directly with the Medical Officer on call or Pathologist on call.
 3. Postmortem examination is usually performed during office hour but requests can be made after office hour
 4. A clinical summary together with the case notes and consent form shall be sent to the Medical Officer or Pathologist on call.
 5. The requesting specialist from the clinical department is required to present during the autopsy.
- c. Referral
 - i. Referrals or cases for expert opinion are welcome.
 - ii. For consultation
 1. The client (clinician etc) can communicate directly with the pathologist
 - iii. Referral for expert or second opinion
 1. For HTF patients that needs expert or second opinion, the requesting doctor (clinician etc) is required to fill up request form as routine cases and submit it to Histopathology Laboratory together with the specimen (paraffin embedded tissue, stained and/or unstained slides). Paraffin embedded tissue is preferred if the cases needed further ancillary studies or staining.
 2. For outside cases, the material together with referral letter should be sent to Histopathology Laboratory. The fax number or email address where the report needs to be sent to should be provided by the requesting doctor.
 3. If the case has been reported elsewhere, a copy of the report should be provided.

5. Specimen Collection and Container

- a. All specimens for routine histological examination are to be fixed in 10% neutral buffered formalin (NBF) in a suitable clean leak-proof container.
- b. The container should have wide opening and if possible with screw cap to prevent leakage
- c. The volume of formalin used must be at least 10 times the volume of the specimen to be fixed. Do not put large specimen in small containers as this would prevent proper fixation of tissue and distort the specimen.
- d. All specimen containers should have the same identification details as that written on the request forms.

- e. Multiple small specimens such as gastrointestinal biopsies should ideally be mounted on a piece of filter paper and immediately put in formalin.
- f. Specimen from different anatomical sites should be sent in separate container, properly labeled and must be clearly itemized in the request form.
- g. For cases that require confirmation of the adequacy of surgical excision, the margin of the specimen must be marked or tagged accordingly by sutures or diagrammatic representation of excised specimen.

6. Specimen's Labeling

- a. All request specimen's bottle should be filled legibly, completely and must have at least below:
 - i. Name of the patient (similar as in the request form)
 - ii. Patient identity card (I/C) number or/and hospital register number (RN) or/and any unique identity number (similar as in the request form)
 - iii. Test requested
 - iv. Label on the container not the lid to avoid loss of label when the lid is removed.

7. Dispatch and Transportation of Histopathology Specimen

- a. Specimens for routine histopathological examination should be sent directly to Histopathology Laboratory (not to the main specimen reception counter)
- b. All specimens should be sent to Histopathology Laboratory after resection as soon as possible. However, in the case of delay, the specimen is stable in fixative (10% formalin solution) at room temperature.
- c. Fresh tissue specimen for immunofluorescent staining should be sent immediately to Histopathology Laboratory without delay.

8. Histopathology Reports

- a. Reports of biopsies for histopathological examination which are labelled 'urgent' will be available within 3 working days after reception of specimen (unless the specimen is a large resected specimen (more than 2cm), needs additional tests, second opinion etc)
- b. Please leave the requesting doctor's name (preferably medical officer and specialist) and contact number on the request form for early flagging of result.
- c. Report enquiry
 - i. Report enquiry can be made via extension 8188 (pathologist room or through iLab tracing system). Accession number of the specimen (HPE number) can be obtained from the Histopathology Laboratory and iLAB. The requesting doctors are welcome to discuss the cases directly with the reporting pathologist or medical officer.
- d. Collection of report
 - i. All histopathology report shall be collected from histopathology laboratory or through iLAB by respective clinics/ wards/ departments personnel.
 - ii. Request for second copy shall be made through Histopathology Laboratory or iLAB by an authorized requestor.

9. Critical Limit

- a. All cases reported within critical limit should be in form to the clinician in the same day cases reported.
- b. Critical limit criteria is listed in **appendix 8**

10. After Office Hours Specimen

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

11. Interdepartmental Clinicopathology Conference

- a. Histopathology Unit, in conjunction with Radiology Department, conducts clinicopathology conference (CPC) with major clinical department in HTF. The schedule is issued every month.

12. Taking out Paraffin Blocks/Slides/Image from Histopathology Unit

- a. Patients' paraffin blocks and slides are archived in Histopathology Unit
- b. For certain valid reasons the unit allows the clinician to take diagnostic material (paraffin block/slide/image) from the Unit. The following procedures must be followed:
 - i. The request to get the diagnostic material must be made by a medical officer.
 - ii. The requestor needs to fill up form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8. Hospital director approval is needed for a request from outside HTF. Request letter is a must for the latter.
 - iii. Form or letter should be submitted to Histopathology Laboratory
 - iv. The paraffin block and stained slides must be returned to Histopathology Laboratory within 1 month.

13. Taking out Tissue from Histopathology Unit

- a. All specimens (tissue) sent to and officially received by Histopathology Laboratory will be kept in the unit up for at least 3 months with few exceptions.
- b. The Histopathology Unit allows the patient to take their tissue, organ or limb back upon request. Please follow this procedure.
 - i. The patient or next of kin must make a formal request through authorized requestor. On behalf of the patient or next of kin, the authorized requestor must make a formal request by filling up a form 'Borang Tuntutan Spesimen HPE' HTF/PL/Histo/B-07. This form is available at Histopathology Laboratory.
 - ii. The completely filled up form should be submitted to Histopathology Laboratory. The form should be submitted within 3 months of specimen reception. **If there is no request after 3 months**, the tissue will be disposed.
 - iii. The tissue is released only after the specimen is being examined by the Pathologist **and** adequate sampling has been taken for reporting **and** has been kept for 3 months (in case there is a need for second look).
 - iv. The tissue will be given to authorized requestor on behalf of the patient or next of kin. The patient or next of kin is not allowed to take the tissue from the laboratory directly.

14. 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 head of unit
- c. For presentation:
 - i. The requesting doctor should communicate directly with the Pathologist concerned
 - ii. A request shall be made by filling up a form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8 which is available at the Histopathology Laboratory. The completed form should be submitted to the Histopathology Laboratory.
- d. For publication:
 - i. The requesting doctor shall communicate directly with the Pathologist concerned followed by filling up the request form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8.
 - ii. The abstract of the publication should be provided, and the Pathologist concerned who reported the case should be included as co-author if possible.
- e. The microscopic histopathology images will be available within 2 weeks upon submission of the form. Only soft copy of the images is provided and the requester should provide a CD before collecting the images from the unit.

15. Research

- a. The histopathology unit welcome research projects or studies to be done in collaboration with our unit
- b. All research project shall be registered under National Medical Research Register (NMRR).
- c. All collaboration studies or research project must have approval from the Head of Pathology Department.
- d. A copy of research proposal must be provided.
- e. One pathologist from the unit shall be appointed as collaborator or co-researcher if possible.
- f. The researcher will be assisted by the appointed Pathologist to retrieve the materials required if the research project requires archival material from this unit.
- g. all archival slides can be borrowed for review in the unit only.
- h. If paraffin blocks are required for further testing, sections should be done at the allocated station in this laboratory.
- i. No archival material should be taken out from Histopathology Unit.

16. Laboratory Turn Around Time

Test	LTAT	LTAT (Urgent)
Small biopsy	14 days	3 working days*
Other HPE specimen	14 days	NA

*Apply only for small biopsy less than 20mm in diameter without any additional test or requiring second opinion.

CYTOPATHOLOGY LABORATORY HANDBOOK

1. List of Service

- a. Exfoliative Cytology
 - i. Gynaecological Cytology (Cervical Pap Smear)
 1. Conventional pap smear
 2. Fluid-based pap smear
 - ii. Non Gynaecological Cytology –body fluid, CSF, urine, sputum, brushing etc
- b. Apiration Cytology
 - i. Fine Needle Aspiration Cytology
- c. Seminal Fluid Analysis

2. Service Hour

- a. Monday to Friday: 8.00am-5.00pm (Reception of specimen will be until 4.00pm for all specimen type except for seminal fluid analysis until 11am).
- b. Closed: Saturday, Sunday and Public holiday

3. Contact Number

- a. Pathologist Room: 8188
- b. Cytopathology Laboratory: 8187

4. Request Form

- a. A copy of PER-PAT 301-form for routine cytological examination (Non-Gynaecological Cytology, Fine Needle Aspiration and Seminal Fluid Analysis).
- b. A copy of PS 1/98 (Pindaan 2007)- form for gynaecological cytology examination.
- c. All request form should be filled legibly, complete with relevant clinical history and finding and must have at least below:
 - i. Name of the patient
 - ii. Patient identity card (I/C) number or/and hospital register number (RN) or/and any unique identity number
 - iii. Gender
 - iv. Age
 - v. Ward/Clinic

- vi. Test requested
- vii. Time and date specimen taken
- d. The clinician should have his/her name, designation and department clearly written on the request form.
- e. If urgent result is required, please indicate so by marking 'URGENT' over the upper right-hand corner of the form. Seminal fluid analysis and gynaecological cytology are not considered as an urgent request.
- f. Rejection criteria is listed in **appendix 12**

5. Specimen Collection

- a. Gynaecological Cytology
 - i. Conventional
 1. Label a clean glass slide with patient's name and IC number with pencil on the frosted end
 2. **DO NOT** use lubricant on the speculum
 3. Place cervical spatula at the external os and rotate through 360° degree, lightly scraping the squamo-columnar junction
 4. Smear the material onto the labeled glass slide about as thick as a blood film
 5. Fix the slide immediately, either by immersing it in a coplin jar containing 95% alcohol for at least 30minutes or use a spray fixative
 6. Air dry the fixed slide
 7. Place the slide in a slide mailer and dispatch to the cytology laboratory
 - ii. Fluid Based
 1. Label the vial with patient's name and IC number
 2. **DO NOT** use lubricant on the speculum
 3. Obtain an adequate sample from the cervix using a broom-like device. Insert the central bristles of the broom into the endocervical canal deep enough to allow the shorter bristles to fully contact the ectocervix. Push gently, and rotate the broom in clockwise direction five times.
 4. Rinse the broom into the vial containing fixative solution by pushing the broom into the bottom of the vial 10 times, forcing the bristles apart. As a final step, swirls the broom vigorously to further release material. Discard the collection device.
 5. Tighten the cap and send the vial to the cytology laboratory
- b. Sputum (Specimen must be collected on three consecutive days)
 - i. Instruct the patient to empty the mouth of all saliva immediately after he wakes up in the morning
 - ii. The patient should then cough deeply and collect the resulting sputum in the container supplied
 - iii. The specimen must sent immediately to the cytology laboratory
 - iv. **DO NOT** forget to collect a similar specimen on the next two days
 - v. The specimen container should be labelled according to the day the specimen is collected.
 - vi. For sputum specimen submitted as smears;
 1. Label two clean glass slides for each patient with name and IC number
 2. Prepare smears as thick as blood film and immediately place the slides in 95% alcohol for at least 30 minutes or use spray fixative
 3. Air-dry the smears
 4. Ensure the slides are not placed face to face in the slide mailer
- c. Urine
 - i. The patient should void and discard the first morning urine specimen.

- ii. Collect the next voided urine and send immediately to the cytology laboratory (minimum 20mL).
- d. Body Fluid (Pleural fluid, peritoneal fluid, pericardial fluid, CSF, synovial fluid, cyst fluid etc)
 - i. Specimens are collected in clean containers and dispatched immediately to the cytology laboratory.
 - ii. If delay is anticipated (>12 hours), refrigerate at 4°C.
- e. Brushing (Bronchial brushing, CBD brushing, etc)
 - i. Label one to three clean glass slides with patient's name and IC number
 - ii. Smear the material about as thick as a blood film
 - iii. Immediately place the slides in 95% alcohol for at least 30 minutes or use spray fixative.
 - iv. If more than one slide is to be placed in the same slide mailer, ensure that they are not placed face to face.
- f. Bronchoalveolar lavage (BAL) and bronchial washing
 - i. Specimens are collected in clean containers (minimum 20mL) and dispatched immediately to the cytology laboratory.
 - ii. If delay is anticipated (>12 hours), refrigerate at 4°C.
- g. Fine Needle Aspiration Cytology (FNAC)
 - i. The FNAC clinic is conducted three times a week at the Surgical Outpatient Department (SOPD) (Tuesday and Thursday at 3pm) and ENT Department (Friday at 11am), HTF for palpable lesions on appointment basis. This applies for inpatient as well out patient except for critically ill patient. Please get appointment from Surgical Department or ENT Department in accordance to their policy and procedure.
 - ii. FNAC for deep seated lesions are conducted at Radiology Department by respective Clinician in accordance to Radiology Department policy and procedure.
 - iii. FNAC should
 - 1. Be requested by specialists or medical officer under specialist supervision.
 - 2. The request form should be filled legibly, complete with relevant clinical history and findings. Whenever there is more than lump or swelling present, the clinician should indicate which lump/s or swelling/s to be aspirated.
 - 3. A signed consent from the patient should be obtained by the aspirator. The aspirator explains to the patient regarding the procedure including limitation and alternative etc.
 - iv. Urgent FNAC
 - 1. Any request for urgent FNAC, please contact anatomic pathologist incharge/cytology technician incharge.
 - v. Please note that:
 - 1. Breast and thyroid cyst may be aspirated by the aspirator and material sent for cytology examination
 - 2. Indication of thyroid FNAC will follow American Thyroid Association
 - 3. Vascular lesions or those of vascular origin are not suitable for FNAC
 - 4. FNAC for deep seated lesions are performed by radiologist under image guided on appointment basis. Please refer to Radiology Department policy and procedure.
 - 5. All thyroid shall undergo ultrasound scan before posted for FNAC
- h. Seminal Fluid Analysis

- i. Patients are instructed not to have sexual intercourse/ masturbation at least 3 days prior to the check up.
- ii. If the semen sample was collected at home, it must be brought to the lab within ½ hour after collection.
- iii. Ensure that the collection bottle is clean, dry and sterile. It can be obtained from the clinic or laboratory.
- iv. Patients are advised to empty their bladder first before collection of semen.
- v. Patients must wash their penis with soap and water prior to collection.
- vi. Collection is by masturbation without the use of aids like condom.
- vii. Ensure that all of the semen produced is deposited in the specimen bottle.
- viii. The full semen analysis requires time. Patients are advised to deliver the semen sample as early as possible to the laboratory to ensure that a complete analysis can be done.

6. Specimen's Labeling

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

7. Critical Limit

- a. All cases reported within critical limit should be in form to the clinician in the same day cases reported.
- b. Critical limit criteria is listed in **appendix 8**

8. Receiving Counter

- a. Reception of all specimens will take place at secondary counter in Histocytopathology Unit except for seminal fluid analysis sample.
- b. Seminal fluid analysis sample will be received at the primary counter, department of pathology since it will send by the patient himself.

9. Laboratory Turn Around Time

Test	LTAT	LTAT (Urgent)
Pap Smear	14 days	NA
Non Gynae	7 days	3 working days (routine only)
FNAC	7 days	3 working days (routine only)
Seminal Fluid Analysis	3 working days	NA

POLICY FOR HANDLING OF ANATOMIC PATHOLOGY (AP) SPECIMEN IN OPERATION THEATRE (OT), ENDOSCOPIC ROOM ETC

1. Surgical team should coordinate the information concerning the specimen and procedure:
 - a. Type of specimen eg frozen section, culture, specimen to be placed in preservatives
 - b. Require special test eg gram stain, acid fast or mycology
 - c. Type and size of needed container and whether need clean or sterile.
 - d. Type of preservative
2. Specimen identification begins at the time the specimen is removed from the patient and identified by the surgeon.
3. The scrub nurse verifies (shout out) the specimen, what tests are to be performed by pathology, and if they may pass the specimen to the circulating nurse.
4. The specimen should be passed off the sterile field **as soon as possible**. Should the specimen need to be held on sterile field the scrub nurse will have a designated area and label the specimen description. Write down/read back verification between the scrub nurse and the

surgeon. Specimen held on the sterile field must be maintained in a manner to preserve the specimen.

5. The circulating nurse will verbally verify back (shout out) the type of specimen and what test are to be performed by pathology to the surgeon and the scrub nurse.
6. The specimen must be placed into appropriate container with appropriate fixative (10x the specimen volume **as soon as possible**). If this cannot be completed in a timely manner, the specimen should be placed in a sterile basin and kept moist with sterile saline or wrapped in saline-soaked sponges until the specimen can be passed off the sterile field to the circulator and placed in the container with fixative
7. The scrub nurse/circulating nurse must request time to complete specimen handling prior to going to the next part of a procedure if it is a “multiple part” procedure.
8. The following information should be **immediately** written on the label in **the operating room by the circulating nurse**.
 - a. Type of specimen
 - b. Site of specimen include right and left
 - c. Two unique identifier eg patient name and hospital number
 - d. Date and time specimen removed
9. Label on the container not the lid to avoid loss of label when the lid is removed.
10. Used permanent ink when writing the information
11. Label biohazard if indicated to alert health care worker.
12. The surgeon **or** the medical officer who assisted the procedure will check back and verify the labeled specimen. Make sure that the labeling is correct:
 - a. Type of specimen
 - b. Site of specimen include right and left
 - c. Two unique identifier eg patient name and hospital number
 - d. Date and time specimen received
13. Fill up Pathology Request Form (electronic or non-electronic). Make sure the patient name and IC/RN number is absolute the same as in the specimen label. Follow procedure to fill up request form published by the laboratory.
14. Authorized the request by put a signature on the form.
15. Transporting of specimens with documentation of chain of custody for all specimens.

POLICY FOR HANDLING OF ANATOMIC PATHOLOGY (AP) SPECIMEN OF A HIGHLY CONTAGIOUS DISEASE

1. This policy is applicable for handling of specimen from a highly contagious disease or suspected of having highly contagious disease or any condition need similar treatment as instructed by the top management.
2. The clinician should identify those patients described in 1 and do risk management in relation to staff safety. Discussion with the respective anatomic pathologist is compulsory. The anatomic pathologist will give instruction on specimen handling procedure to avoid specimen rejection and risk of exposure to the staff.
3. The laboratory will accept all specimen and test except:
 - a. Fresh specimen
 - b. Cytology test from respiratory system (sputum, Bronchial Aspiration/Washing, Tracheal Aspirate etc)
4. Kindly contact anatomic pathology in charge should request other than 3 is indicated.
5. Collect specimen according to national and local policy. Triple packaging is mandatory. Make sure requested form is inserted in a different biohazard plastic.
6. Despatch the request form and specimen to “Kaunter Khas Jabatan Patologi”. Transportation procedure shall follow national and local policy especially on personnel protective equipment (PPE). Notify Histocytopathology Unit’s staff before sending the request form and specimen.

UNIT PATOLOGI KIMIA

INTRODUCTION

The Chemical Pathology Unit offers its diagnostic services to all patients in Hospital Tuanku Fauziah and Klinik Kesihatan in the Perlis state.

The Diagnostic Services provided are: -

1. STAT/Urgent tests
2. Routine tests
3. Special tests
4. Analysis of Drugs of Abuse in Urine (DOA)
5. 24 hour Service

URGENT AND 24-HOURS SERVICES

- Urgent/STAT tests should be requested only when required for immediate patients care.
- The following lists are tests which can be requested for urgent or STAT during and after office hours
 1. Blood gases
 2. Blood urea and electrolytes (BUSE)
 3. Renal Profile (including Creatinine)
 4. Serum Bilirubin (paediatrics)
 5. Cardiac markers (CE & Trop I)
 6. Serum Amylase (TRO acute pancreatitis)
 7. Hcg (Ectopic cases)
 8. TFT (TRO Thyroid storm)*
 9. Urine Paraquat
 10. TDM (PCM)**
 11. Ammonia*
 12. CSF biochemistry

*Please discuss with chemical pathologist before sending

**Please discuss with chemical pharmacist before sending

Most tests are run daily, specimens which arrive early in the morning, are processed within 4 hours for routine chemistry tests. Some of immunoassay tests and special tests shall be analysed in batches for cost effectiveness purposes.

LIST OF TESTS

a) General chemistry

Bil	Profile	Ujian	Bekas	Catitan
1	Cardiac Enzymes	AST, CK (CKMB when needed), LDH, Trop i	Lithium Heparin	4ml darah
2	Fasting Lipid Profile (FLP)	Cholesterol, Triglycerides, HDL-C LDL-C	Lithium Heparin	
3	Liver Function Test (LFT)	Total Protein, Albumin, Globulin, Bilirubin Total (Direct dan Indirect Bilirubin akan dilakukan sekiranya total bilirubin tinggi), ALP, ALT& AST	Lithium Heparin	
4	Preclampsia Profile (PE)	LFT, RP, Uric acid	Lithium Heparin	

5	Renal Profile	Na,K,Cl, BUN, Creatinine	Lithium Heparin	
6	FBS/RBS	Glucose	Sod.Fluoride	
7	Iron study	UIBC, Iron, Feritin	Lithium Heparin	
8	CRP	CRP	Lithium Heparin	
9	Lactate	Lactate	Sod.Fluride with ice	
10	Ammonia	Ammonia	EDTA with ice	Dengan temujanji telefon
11	TDM	Acetaminophen, Amikacin, Carbamazepine, Digoxin, Gentamicin, Phenobarbitol, Phenytoin, Theophylline, Valproic acid, Vancomycin	Lithium heparin	
12	Blood gases (arterial/venous/cord)	pH, pO ₂ , pCO ₂	Heparin syringe	1 ml
13	HbA1c	HbA1C	EDTA	Permohonan ujian kurang 3 bulan dari ujian yang terdahulu akan ditolak.
14	Body fluids/CSF	pH, Protein, Glucose	Urine container/ Universal bottle	Min 10 ml
15	Osmolality tests	Urine/serum osmolality	Urine container/ Lithium heparin	
16	Stool	Stool Occult Blood	Stool container	
17	Procalcitonin	Procalcitonin	EDTA	Untuk kes COVID-19 sahaja

** Pastikan guna tiub Lithium Heparin bagi ujian biokimia sahaja (dilakukan di HTF) *

b) Urine test

Bil	Profile	Ujian	Bekas	Catitan
1	Urine biochemistry (10 parameters)	Glu, Prot, Bilirubin, Urubinogen, pH, S.G., Blood, Ket, Nit., Leu.	Urine container	Min 20 ml
2	Urine spot/Urine 24 hours	Amy, Uric Acid, Calcium, Prot., Crea, Electrolytes (Na,K,Cl), Urea, Glu., Phos., Mag	Urine container/ urine 24hrs container	
3	Urine toxicity	Urine Paraquat	Urine container	Dijalankan sebagai ujian segera

c) Immunoassay tests

Bil	Profile	Ujian	Bekas	Catitan
1	Tumour marker	Alpha feto protein, CA125, CA19-9, Total PSA, CEA	Lithium Heparin	Kriteria bagi permohonan ujian immunoassay:
2	Ujian khas lain	Estradiol, FSH, BHCG, LH, Progesterone, Prolactin, Testosterone, TSH, FT4,	Lithium Heparin	1) Permohonan

		FT3, Cortisol		ujian yang lengkap dengan ringkasan klinikal yang relevan 2) Diagnosis pesakit yang betul 3) Memerlukan countersign pakar perubatan untuk semua permohonan kecuali ujian TSH/FT4, boleh dipohon oleh pegawai perubatan gred UD48 dan keatas
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d) Drug of Abuse

Bil	Profile	Ujian	Bekas	Catitan
1	Screening drugs	Codeine and cannabis	Urine container	Min 20 ml. Please follow chain of custody.
2	Confirmatory tests	Morphine and cannabinoids	Urine container	Min 20 ml. Please follow chain of custody.

COMMUNICATION

For any inquiry of the service or tests provided by the Chemical Pathology Laboratory, Hospital Tuanku Fauziah, kindly contact ext. 8196 (Chemical Pathologist), 8192 (Senior Scientific Officer) or ext 8190 (lab).

REQUEST FORMS

All specimens must be accompanied with PER.PAT 301 form. Forms must be filled LEGIBLY and COMPLETELY with the following information:

- Patient's details: Name, IC number, sex, age and ward/hospital name
- Patient's clinical and test details : relevant clinical history, diagnosis, test required, type of sample, time and date of collection
- Requesting doctor's details: name, stamp and signature

SAMPLE COLLECTION

All specimens must be sent in their respective containers, the use of inappropriate containers will cause misleading results. The following minimum information must be provided on the labels of specimens:

- Name of patient
- I.C. number/ Registration Number
- Ward / Clinic

- Name of test
- Date

Most chemical pathology tests are performed using serum and plasma heparin 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 specimen, minimum tourniquet pressure should be applied during venepuncture in order to avoid forcing of free fluid from capillaries which may result in hemoconcentration and spurious elevations of protein and protein bound substance eg: total protein, calcium. If possible, tourniquet should be release after no more than 1 minute from the initial placement.

Hemolysis can effect 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.

Special requirements are needed for certain tests:

- HbA1c : test required whole blood sample that needs to be collected in EDTA tube. Request less than 3 months from previous result will be rejected.
- Morning serum cortisol : between 8 to 10 am
- Midnight serum cortisol : between 10 to 12 pm
- Fertility test : Sample for progesterone should be collected at day 21 of menstrual cycle, while sample for estradiol, FSH and LH should be collected at day 2 to 5 of menstrual cycle.
- Certain tests are required to be sent in ice such as Ammonia, Lactate and Blood Gases.

SPECIAL TEST INSTRUCTION AND COLLECTION PROCEDURE

Arterial Blood Gases

Procedure of collection

- Indicate time of arterial or venous puncture in the request form.
- Use a 1 ml disposable syringe.
- Flush the syringe with heparin solution.
- Draw 1 ml of arterial blood.
- Invert the syringe and remove all air bubbles inside the syringe. Discard the needle to prevent needle stick injury incidence and recap with special stopper provided to avoid specimen exposure to air.
- Mix well by rolling the syringe between palms to prevent clotting.
- Put syringe of blood in slurry ice bath and send immediately to the lab.
- Sent the specimen immediately for analysis (within 30 minutes).
- The specimen should not be sent by pneumatic tube.
- Please do not send the specimen if the needle still attached to the syringe.

Important notes

Put the specimen in a specimen plastic bag and keep the specimen in a container with a mixture of crushed ice and water or other suitable coolant, large enough to permit immersion of the entire barrel of the syringe. No direct contact with ice.

Ammonia and Lactate

Ammonia : Specimen should be sent immediately in EDTA tube with ice. Please make an appointment via telephone so that laboratory's staff will standby the analyser for analysis of ammonia. Specialist signature is needed to proceed the analysis of ammonia test.

Lactate : Specimen should be sent immediately in Sodium Fluoride tube with ice. Separation of cell through centrifugation at the laboratory must done within 30 minutes. Haemolysed specimen may affect the results.

Fasting Serum Lipid

Blood should be collected after fasting between 9 to 12 hours with no calories intake.

Fasting Blood Sugar

Blood should be collected after an overnight fasting for at least 9 hours with no calories intake.

eGFR test

Information needed :

- Relevant clinical history
- Previous creatinine result, if available
- Previous creatinine clearance, if available
- Previous calculated eGFR result, if available

Only serum or plasma creatinine sample sent along PER.PAT 301 form shall have its eGFR calculated.

Calculation of EGFR using previous creatinine result shall not be allowed. This is because previous eGFR result could lead to misinterpretation of the test correlating to the current patient status.

Serum Ascites Gradient Test (SAAG)

Send both serum and fluid specimen that are taken on the same day for the SAAG determination.

HbA1c

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

Important notes:

- Test should be performed for monitoring of patients diagnosed with diabetes mellitus.
- Repeated testing should be done six monthly if stable and 3 monthly if the glycemic control is poor and recent adjustment in medication being done.
- Several condition may affect the HbA1c result (haemolytic anemia, iron deficiency anemia, end stage renal failure and hemoglobinopathies) leading to possible misinterpretation of the result. In this condition, blood glucose monitoring or fructosamine is preferable.

24-hours Urine

Procedure of collection:

- On the day of collection, the first urine voided must be discarded. Time of first urine voided is the start of the timing for the 24 hours collection.
- Collect the second and subsequent voided urine for 24 hours from the time start.

- For male patient, it is advisable not to void the urine directly into the 24-hours urine bottle. This is to avoid possible chemical burns.
- For the best result, refrigerate if possible.
- Label the bottle as directed and send immediately to the laboratory.

For 24-hours urine catecholamines, minimum 500ml of urine should be collected. Please note that, 10ml of 25% HCl (preservative) is added into the bottle as preservative.

RECEIPT OF SPECIMEN

All Chemical Pathology tests are received at the main counter by counter's staff. Any incomplete forms, label, wrong containers, inadequate volume and samples which do not fulfil criteria of acceptance will be rejected.

All request forms must stamp the reception time.

REPORTING OF RESULTS

Results are validated by Chemical Pathologist/Scientific Officer/trained Medical Laboratory Technology according to the test following laboratory turnaround time.

ENQUIRY & INFORMING OF TEST RESULTS

As most of the test results are numerical, tracing of results via telephone is not encouraged. Enquiry of test results can be made via web-based. (ilab.webhop.net/htf and E-delphyn)

Notification of chemical pathology critical results shall be performed by the laboratory personnel according to 'Quick Guide for Improving Notification of Critical Laboratory Results in MOH Hospitals' through telephone.

UNIT MIKROBIOLOGI

1. Perkhidmatan

Waktu perkhidmatan bagi Unit Mikrobiologi adalah seperti berikut:

- Hari bekerja : 8.00 pagi - 10.00 malam
- Sabtu/Ahad/Cuti umum : 8.00 pagi - 10.00 malam

2. Prosedur Permohonan Ujian

- a) Semua permohonan ujian perlu menggunakan borang yang telah ditetapkan.
- b) Setiap borang permohonan hendaklah diisi dengan **LENGKAP**
 - Untuk kes CRBSI, tarikh dan masa spesimen diambil MESTI diisi
 - Untuk kes pre-exchange transfusion (PRE ET) bagi bayi yang prolong jaundice, MESTI ditulis PRE ET dalam ringkasan klinikal. Ujian saringan adalah HBsAg, HCV dan HIV sahaja. Tiada indikasi untuk saringan dilakukan bagi kes POST ET.

3. Penolakan Permohonan Ujian

Sebarang permohonan yang tidak memenuhi kriteria akan menyebabkan permohonan ujian ditolak. Sila rujuk Appendix 7 (Kriteria penolakan Unit Mikrobiologi).

4. Tatacara pengambilan spesimen (umum):

- a) Pengambilan spesimen nanah/luka menggunakan swab adalah tidak digalakkan kerana risiko kontaminasi. Digalakkan menghantar aspirasi nanah atau tisu yang diambil secara aseptik.
- b) Bagi spesimen biopsi untuk kultur, pastikan spesimen TIDAK dimasukkan dalam larutan formalin.

5. Panduan umum untuk ujian kultur dan sensitivity (C&S):

- a) Sampel perlu diambil berdasarkan diagnosis yang dilakukan dan bukan sebagai pakej.
- b) Sampel perlu diambil sebelum memulakan rawatan antibiotik.
- c) Sampel perlu dihantar segera ke makmal (dalam masa 30 minit selepas pengambilan sampel dilakukan).
- d) Pastikan penggunaan media pengangkutan yang betul untuk setaip sampel yang diambil.
- e) Pastikan isipadu atau saiz sampel yang mencukupi sebelum dihantar.
- f) Jika sampel yang diambil dalam kuantiti yang sedikit, utamakan untuk ujian kultur.
- g) Untuk sampel daripada luka atau ulser yang kering, pastikan swab dibasahkan dengan sterile saline sebelum mengambil sampel. Swab mestilah dilakukan di tengah bahagian luka untuk mengelakkan kontaminasi dari persekitaran kulit.
- h) JANGAN GUNA LARUTAN FORMALIN UNTUK SAMPEL TISU.
- i) Untuk kes-kes yang disyaki jangkitan anaerobe (deep seated abscess, brain abscess, osteomyelitis, empyema, intraabdominal infections, septicaemia) perlu menggunakan media pengangkutan anaerobe:
 - Blood culture bottle anaerobe untuk kes septicaemia
 - Robertson's Cooked Meat media untuk sampel lain
- j) Pastikan borang diisi dengan maklumat pesakit yang betul berserta ringkasan klinikal yang tepat termasuk sejarah penggunaan antibiotik.

INDICATION FOR INFECTIOUS DISEASE SCREENING

Priority	HBsAg	Anti-HCV	HIV Ab	Anti HBs	RPR/VDRL
Urgent (result to be ready within 6 hours)	Organ/Tissue transplant	Organ/Tissue transplant	Organ/Tissue transplant	Organ/Tissue transplant	Organ/Tissue transplant
Urgent (result to be ready within 24 hours)	Needle stick injury/splash injury (HCW & source)	Needle stick injury/splash injury (HCW & source)	Needle stick injury/splash injury (HCW & source)	Needle stick injury/splash injury (HCW only if never screened before)	
Routine	<ul style="list-style-type: none"> - Antenatal screening - Patient admitted or attended clinic with risk factor (IVDU, sexual promiscuity, history of blood transfusion, tattoos) - Individual with high risk partner. - Screening for positive partner. - Pre-ET sample for baby - End stage renal failure for HD - Thalassaemia - HIV positive - Patient with suspected nephritis/persistent proteinuria - Patient planned for 	<ul style="list-style-type: none"> - Patient admitted or attended clinic with risk factor (IVDU, sexual promiscuity, history of blood transfusion, tattoos, intranasal drug abuse) - Individual with high risk partner. - Screening for positive partner. - Pre-ET sample for baby - End stage renal failure for HD - Thalassaemia - HIV positive - Patient with suspected nephritis/persistent proteinuria - Patient planned for 	<ul style="list-style-type: none"> - Antenatal screening - TB positive - Patient admitted or attended clinic with risk factor (IVDU, sexual promiscuity, history of blood transfusion, tattoos) - Individual with high risk partner. - Screening for positive partner. - Pre-ET sample for baby - End stage renal failure for HD - Thalassaemia - Patient with suspected nephritis/persistent proteinuria - Young stroke* - Ophthalmology diseases: 	<ul style="list-style-type: none"> - HCW after completed 3rd dose vaccination/booster (stop if level >10 mIU/ml) - ESRF on HD - Thalassaemia - Family history of Hepatitis B carrier. - HIV patient (6 monthly) - Hemophilia 	<ul style="list-style-type: none"> - Antenatal screening - Patient suspect STD (signs & symptoms) - Individual with high risk partner - Screening for positive partner - Neurosyphilis - Dermatology condition suspicious of syphilis (gummatous lesion, rashes) - PID

<ul style="list-style-type: none"> cardiothoracic surgery - Family history of Hepatitis B carrier - Patient with jaundice for investigation (make sure give LFT result in form)* - Medicolegal cases (sexual abuse, prison inmate) - Sensory neural hearing loss (SNHL)* - Elevated transaminases (ALT & AST) >250 U/L - Progressive increase ALT & AST (> 3x from baseline) - Chronic/recurrent urticarial* - Cirrhosis - Liver cancer - Blood donor screening - Medical check-up - Pre-Chemo/immunosuppressive drug - Procedure in vitro Fertilization (IVF) - Hemophilia - STD/PID - Persistent thrombocytopenia 	<ul style="list-style-type: none"> cardiothoracic surgery - Patient with jaundice for investigation (make sure give LFT result in form)* - Medicolegal cases (sexual abuse, prison inmate) - Sensory neural hearing loss (SNHL)* - Elevated transaminases (ALT & AST) >250 U/L - Progressive increase ALT & AST (> 3x from baseline) - Chronic/recurrent urticarial* - Cirrhosis - Liver cancer - Blood donor screening - Medical check-up - Pre-Chemo/immunosuppressive drug - Procedure in vitro Fertilization (IVF) - Hemophilia - STD/PID - Persistent thrombocytopenia 	<ul style="list-style-type: none"> retinitis, viral keratitis* - Patient planned for cardiothoracic surgery - Medicolegal cases - (sexual abuse, prison inmate) - Sensory neural hearing loss (SNHL) - Pyrexia of unknown origin (fever >3 weeks with unknown cause) - Septicaemic shock admitted to ICU/HDW – resistant to treatment & progressively worsen - Severe & progressive headache with unknown cause (can be Cryptococcus infection)* - HIV dermatological manifestations (rashes/vesicles/herpes zoster) - Unresolved pneumonia & suspicious of PCP(exclude TB)* - Chronic/persistent diarrhea* - Persistent worsening pancytopenia(thrombocytopenia/leukopenia/anaemia)* - Blood donor screening - Medical check-up 		
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			<ul style="list-style-type: none">- Pre-Chemo/immunosuppressive drug- Procedure (IVF)- Hemophilia- STD/PID		
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*STD : Sexually Transmitted Disease, PID : Pelvic Inflammatory Disease

INTERVAL FOR INFECTIOUS SCREENING IN SPECIFIC CONDITION

Cases	HBsAg	Anti HCV	HIV Ab	Anti HBs
ESRF on HD	- 0 (baseline) - 6 monthly	- 0 (baseline) - 6 monthly	- 0 (baseline) - 6 monthly	- 0 (baseline) - Yearly
Thalassaemia	- 0 (baseline) - 6 monthly	- 0 (baseline) - 6 monthly	- 0 (baseline) - 6 monthly	- 0 (baseline) - 6 monthly
Needle stick injury/splash injury. (repeat screening referred to baseline date)	- 0 (baseline) - 6 weeks - 3 months - 6 months	- 0 (baseline) - 6 weeks - 3 months - 6 months	- 0 (baseline) - 6 weeks - 3 months - 6 months	- 0 (baseline) - After completed vaccination/booster
HCW taking vaccination for Hepatitis B	- Only do if Anti HBs level <10 mIU/ml after booster given	NA	NA	- 1 month after completed 3 rd dose vaccine - 1 month after taken booster

*High risk patient (not from the group above) screening interval (if last result non-reactive): 3 monthly to detect early seroconversion

Tracing result for Hepatitis B, Hepatitis C, HIV & VDRL/RPR via phone is NOT ALLOWED. If result needed urgent, staff from ward / clinic MUST come to microbiology lab to retrieve the result.

CRITERIA FOR REJECTION

1. No risk factor mentioned in lab form for patient admitted to ward or attended clinic (all cases with * mentioned above).
2. No clinical findings mentioned in lab form suggesting patient is high risk (all cases with * mentioned above).
3. Specimen sent before the expected time interval.
4. Patient already known case of infection before.
5. Post ET sample
6. Specimen post recent (< 1 month) blood/product transfusion /Hepatitis B vaccination (if order HBs Ag – may cause false positive HBsAg)

7. Neonate specimen <18 months (to check for anti HIV/anti HCV/Anti Hbs Ab) without screening from mother (except Pre-ET/transplant case)
8. Elderly patient (≥ 65 years old) without obvious risk factor (elderly people : immune system weaker and susceptible to infection)

*To consult clinical microbiologist if there is justification to perform the test in case patient does not fulfill criteria above.

CLINICAL CRITERIA FOR AUTOIMMUNE DISEASES (JUSTIFICATION FOR LABORATORY TESTING)

Autoimmune Disease	Clinical Criteria
<p>Systemic Lupus Erythematosus (SLE)</p> <ul style="list-style-type: none"> - At least <u>1 or more criteria</u> are subjected to testing (according to EULAR/ACR 2019 entry criterion testing for ANA) - If patient had undergone renal biopsy and result: lupus nephritis → this criteria subjected for testing. - Neonatal lupus : need to screen mother's autoantibodies. - For arthritis symptoms: please rule out rheumatoid arthritis first (include RF result) - Test : ANA, AntiDsDNA, ENA 	<ol style="list-style-type: none"> 1. Acute cutaneous lupus – malar rash or generalized maculopapular rash 2. Subacute cutaneous lupus – annular or papulosquamous cutaneous eruption usually photodistributed. 3. Discoid lupus – erythematous violaceous cutaneous lesion with secondary changes leading to scarring alopecia of the scalp. 4. Oral ulcers – at palate, buccal, tongue (exclude vasculitis, infection, Behcet's disease, Inflammatory bowel disease) 5. Non scarring alopecia – diffuse thinning or hair fragility with broken hair (exclude alopecia areata, drugs, iron deficiency, androgenic alopecia) 6. Synovitis ≥ 2 joints – swelling/effusion/tenderness of joints 7. Joint tenderness in ≥ 2 joints & at least 30 mins of morning stiffness 8. Pleural or pericardial effusion – demonstrated by imaging 9. Acute pericarditis - ≥2 of either pericardial chest pain/pericardial rub/ECG changes :widespread ST elevation of PR depression/worsened effusion on imaging 10. Renal manifestation – proteinuria of 0.5 g/24 hour urine protein 11. Neurological manifestations – seizures/epilepsy, delirium,psychosis, mononeuritis complex(exclude vasculitis/DM), myelitis, peripheral/cranial neuropathy (exclude vasculitis, infection, DM), acute confusional state (exclude toxic, metabolic, alcohol, uraemia, drugs) 12. Autoimmune hemolysis – reticulocytosis, low haptoglobin, elevated indirect bilirubin, elevated LDH & positive Coomb's test 13. Leukopaenia – WBC < 4000 mm³ (at least once), exclude : infection, steroids, portal HPT (possible to include serial reading) 14. Thrombocytopaenia – platelet < 100,000mm³ (at least once), exclude : drugs, infection, portal HPT, Thrombotic thrombocytopaenic purpura(TTP) (possible to include serial reading) 15. Pyrexia of unknown origin – fever ≥38°C for ≥ 2 weeks with undetermined cause

	<p>16. Low complement C3/C4</p> <p>17. Positive Antiphospholipid Antibody – positive lupus anticoagulant, medium-high titre Anticardiolipin antibody or β 2 Glycoprotein 1 antibody</p> <p>18. As investigation for young Hypertension (less than 40 years old)</p>
<p>Sjogren Syndrome</p> <ul style="list-style-type: none"> - At least <u>1 or more criteria</u> are subjected for testing. - Exclude : radiation, hepatitis C, HIV, sarcoidosis, amyloidosis. - Test : ANA, ENA 	<ol style="list-style-type: none"> 1. Eye dryness – feeling of ‘sand’ inside eyes for ≥ 3 months <ul style="list-style-type: none"> - Frequent usage of artificial tears (> 3 times/day) ≥ 3 months 2. Oral dryness ≥ 3 months
<p>Systemic sclerosis/scleroderma</p> <ul style="list-style-type: none"> - At least <u>2 or more criteria</u> are subjected for testing - However if patient presented with criteria no. 1 alone and highly suspect – subjected for testing - Test : ANA, ENA 	<ol style="list-style-type: none"> 1. Skin thickening of fingers of both hands – extending proximal to MCP joints with “puffy” fingers & non pitting swelling (exclude trauma) 2. Telangiectasia (visible macular dilated superficial blood vessel that blanched on pressure) , round, well demarcated at hands, lips & oral cavity. 3. Fingertip lesions – digital tip ulcer, fingertip pitting scar (exclude trauma) 4. Abnormal nail fold capillaries. 5. Pulmonary arterial hypertension. 6. Interstitial lung diseases <p>Raynaud’s Phenomenon at fingers & toes in respond to cold & emotion (pallor, cyanosis, hyperaemia)</p>
<p>Myositis</p> <ul style="list-style-type: none"> - At least <u>2 or more criteria</u> are subjected to testing - To provide full muscular examination in request form. - Test : ANA, ENA 	<ol style="list-style-type: none"> 1. Progressive, symmetrical muscle weakness of Proximal upper or lower extremities: <ul style="list-style-type: none"> - Leg : Proximal muscles weaker than distal - Neck : flexor weaker than extensor 2. Purplish/erythematous patches over periorbital area (Heliotrope rash), oedema might present. 3. Erythematous papular lesions (sometime with scaling) at finger joint, elbow, knee, malleoli & toes. (Gottron’s papule)

	<ol style="list-style-type: none"> 4. Erythematous to violaceous macular lesion over extensor surface of joints (Gottron's sign) 5. Dysphagia/ odynophagia 6. Elevated CK, LDH, ALT or AST
<p>Autoimmune hepatitis</p> <ul style="list-style-type: none"> - Exclude : drugs, toxins & infections - To provide result for viral marker - Radiological finding (if available) - ANA/ASMA/AMA/LKM (to assist in scoring system) 	<ol style="list-style-type: none"> 1. Any features of hepatitis (abnormal LFT – possible to include serial reading for abnormal result) but negative for viral markers. 2. Radiological findings showed features of hepatitis
<p>Primary Biliary Cirrhosis</p> <ul style="list-style-type: none"> - At least <u>2 or more criteria</u> are subjected to testing - Exclude : drugs, toxins & infections - To provide result for viral marker - Radiological finding (if available) - Test : ANA 	<ol style="list-style-type: none"> 1. Extreme, progressive fatigue 2. Generalized pruritus (exclude dermatological/allergic condition) 3. Sign & symptoms of portal hypertension (hematemesis, ascites, hepatic encephalopathy) 4. Abnormal LFT (possible to include serial reading for abnormal result) 5. Radiological findings: cirrhotic liver.
<p>Vasculitis</p> <ul style="list-style-type: none"> - At least <u>2 or more criteria</u> are subjected for testing. - Any biopsy of small vessels performed & suggestive of vasculitis → subjected for testing - ANCA associated vasculitis : Granulomatosis with polyangitis (Wegener's Granulomatosis), Microscopic polyangitis, eosinophilic granulomatosis with polyangitis (Churg Strauss Syndrome) - Test : ANCA 	<ol style="list-style-type: none"> 1. Progressive, intermittent numbness/weakness of hand & foot 2. Presence of purpura, lumps, nodules or ulcers at hand & foot 3. Severe shortness of breath & cough (exclude infection, cancer, heart disease, chronic lung diseases) 4. Lung nodules, cavitation, hilar lymphadenopathy, pleural effusion on imaging. 5. Nasal crusting, saddle nose, stridor, hoarseness of voice, deafness. 6. Uveitis, scleritis, optic neuropathy, retinal vasculitis or retro-orbital pseudotumour (must be assessed by ophthalmologist) 7. Hematuria, proteinuria or rapidly rising creatinine with hematuria. 8. Cranial nerve abnormalities or CNS mass lesion

Pernicious anaemia <ul style="list-style-type: none"> - At least <u>2 or more criteria</u> are subjected for testing - Exclude: infection (HIV), surgery, coeliac disease, inflammatory bowel disease, vegetarian diet, alcohol abuse, medicines (oral hypoglycaemic agent, antibiotics, antiseizures), tapeworm infestation. - Test : LKM 	<ol style="list-style-type: none"> 1. Patient having signs & symptoms of anaemia with FBP showed Macrocytic/Megaloblastic anaemia. 2. Sign & symptoms of Vitamin B12 deficiency : neurological symptoms; smooth, red & thick tongue 3. Serum B12 level : Low

*Test requested by Rheumatologist/Gastroenterologist/Hepatologist/Nephrologist/Endocrinologist is given priority for testing.

*To consult clinical microbiologist if there is justification to perform the test in case patient does not fulfill criteria above.

Notes: for **Psoriasis**, **ANA** test indicated prior to biologic treatment by dermatologist

False positive ANA testing could be due to:

1. Normal people may have 20-30% (titre 1:40) & 10-12% (titre 1:80) positive result.
2. Elderly women (>65 years old)
3. Infection – EBV, TB infection, Hepatitis C
4. Medication (antibiotic, antimalarial, antihypertensive, antiarrhythmic)

UNIT HEMATOLOGI

1. Waktu Perkhidmatan

- Unit Hematologi beroperasi untuk 24 jam
- Ujian yang dijalankan selepas waktu pejabat adalah seperti berikut:
 - Full Blood Count (FBC)
 - PT/APTT
 - G6PD (Hanya dijalankan sehari sekali pada hujung minggu dan cuti umum)
 - ESR
 - D-Dimer

2. No. Sambungan:

- a) Bilik Mikroskop : 8402
- b) Makmal Hematologi : 8189

3. Permohonan Ujian

- a) Semua permohonan ujian hendaklah menggunakan borang yang telah ditetapkan dan diisi dengan lengkap sebelum dihantar ke makmal.

- b) Tarikh dan masa pengambilan spesimen **WAJIB** diisi.

Note : All form must come with date and time of collection. It is a rejection criteria.

- c) Semua permohonan ujian Hematologi **WAJIB** disertakan dengan **Diagnosis** pesakit.

- d) Permohonan untuk ujian-ujian berikut **perlu** disertakan dengan **Ringkasan Klinikal**:

- D-Dimer
- Ujian-ujian Khas Koagulasi (Fibrinogen, Factor VIII & IX Level, Factor VIII & IX Inhibitor Level)
- Full Blood Picture
- Hb Analysis
- Bone Marrow Aspirate
- Trephine Biopsy
- Semua ujian-ujian Makmal Rujukan

- e) Ujian Full Blood Picture (FBP) SEGERA hendaklah dipohon melalui Pegawai Perubatan Jabatan Patologi yang bertugas atas panggilan (MO ON CALL)

- f) Ujian-ujian yang memerlukan temuanji:

- Bone Marrow Aspiration/ Trephine (BMAT)
- PT/APTT Mixing Test
- Factor VIII & IX Level
- Factor VIII & IX Inhibitor Level
- Osmotic Fragility Test (OFT)
- Ujian-ujian Makmal Rujukan yang tertentu (Sila rujuk Makmal Hematologi)

- g) Sila hubungi Makmal Hematologi untuk sebarang pertanyaan mengenai ujian-ujian Makmal Rujukan

- h) Permohonan ujian yang tidak memenuhi kriteria akan menyebabkan permohonan ujian ditolak. Sila rujuk **Appendik 9 (Kriteria Penolakan Spesimen Di Unit Hematologi)**
- i) Spesimen untuk ujian CD4/CD8 perlu dihantar pada hari Isnin sebelum 4.30 petang atau pada hari Selasa sebelum jam 10.00 pagi.
- j) Label pada bekas spesimen hendaklah mempunyai butiran pesakit seperti berikut:
- Nama Pesakit seperti di Kad Pengenalan/ Passport
 - No. Kad pengenalan
 - Ujian yang dipohon

4. Kriteria Penerimaan Spesimen di Unit Hematologi

Bil	Test	Container	Volume	Time Frame	Factor Affecting Result
1	FBC	EDTA	Adult : 2.0ml Paeds: 0.5 ml	6 – 8 hours	Under/Over filling
2	FBP	EDTA	Adult : 2.0ml Paeds: 0.5 ml	Fresh sample (Preferably < 4 hrs)	Storage changes if > 4 hrs
3	Hb Analysis	EDTA	2.0 ml	Fresh sample (Preferably < 4 hrs)	Storage changes if > 4 hrs
4	ESR	ESR Vacuum Tube	1.2 ml	2 – 4 hrs	Under/Over filling
5	Prothrombin Time(PT)	Trisodium Citrate	Adult : 1.8ml Paeds: 1.0 ml	2 – 4 hrs	Under/Over filling
6	APTT	Trisodium Citrate	Adult : 1.8ml Paeds: 1.0 ml	2 – 4 hrs	Under/Over filling
7	PT/APTT Mixing Test	Trisodium Citrate	Adult : 1.8ml Paeds: 1.0 ml	2 – 4 hrs	Under/Over filling
8	Fibrinogen Level	Trisodium Citrate	Adult : 1.8ml Paeds: 1.0 ml	2 – 4 hrs	Under/Over filling
8	D-Dimer	Trisodium Citrate	Adult : 1.8ml Paeds: 1.0 ml	2 – 4 hrs	Under/Over filling

9	Factor VIII/IX Assay	Trisodium Citrate	1.8 ml (2 tubes)	2 – 4 hrs	Under/Over filling
10	Factor VIII/IX Inhibitor Level	Trisodium Citrate	1.8 ml (4 tubes)	2 – 4 hrs	Under/Over filling
11	G6PD	Whatman No.1 filter paper	1.0 blood drop – not less than the size of 10 cent coin	1-3 days	-
12	Bone Marrow Aspiration & Trephine Biopsy	-	-	Appointment Required	-
13	Ujian Makmal Rujukan	Sila rujuk Makmal Hematologi			

5. Nilai Panik (Critical Value)

Keputusan **Nilai Panik** akan dimaklumkan melalui telefon kepada anggota wad atau klinik yang berkenaan dengan segera. Nama anggota yang menerima keputusan tersebut akan direkod. Anggota wad atau klinik perlu mencatat nilai panik yang dimaklumkan untuk tindakan selanjutnya.

6. Penyemakan Keputusan Ujian Makmal Hematologi

Keputusan ujian makmal Hematologi boleh diperolehi melalui Sistem Informasi Makmal (iLab) di laman sesawang **ilab.webhop.net/htf**

SENARAI UJIAN DI JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS
(MENGIKUT SUSUNAN ABJAD)

MS ISO 15189 accredited test

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
1.	ABO and Rh grouping	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	≤4 hours	PER-PAT 301	2 copies of request form
2.	Acid Fast Bacilli (AFB) smear	Mikro	Sterile container	Sputum/ Fluid	-	Send immediately to the lab	Daily	1 day	TBIS 20C	
3.	Activated Partial Thrombin Time (APTT)	Hema	Trisodium citrate	Blood	Adult:1.8ml Paed:1ml	Send immediately to the lab	Daily	2 hours Urgent: 1 hour	PER-PAT 301	*Time dependant test *Please note the time of sampling and anticoagulant treatment
4.	Alanine Transaminase (ALT)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
5.	Albumin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
6.	Alkaline phosphatase (ALP)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
7.	Alpha-fetoprotein (AFP)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	3 working days	PER-PAT 301	
8.	Ammonia	PK	EDTA	Plasma	Adult:2ml Paed:0.5ml	Send immediately to the lab	Weekday: 8am-5pm Weekend: 8am-1pm	1 hour	PER-PAT 301	Send in ice Please make an appointment by phone before sending the specimen
9.	Amylase	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
10.	Anemia test • Ferritin • Iron • Unbound-iron binding capacity (UIBC)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
11.	Antibody Identification (Internal)	BB	Antibody Identification Kit	Blood	6ml	Send immediately to the lab	Working day	≤1 week	PER-PAT 301	Get the Antibody Identification Kit from Blood Bank
12.	Anti-double stranded DNA (dsDNA)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Run in batches	14 working days	PER-PAT 301	Further test of ANA (CTD) or if clinically indicated
13.	Anti-neutrophil cytoplasmic antibody (ANCA)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Run in batches	14-21 working days	PER-PAT 301	
14.	Anti-nuclear antibody (ANA) - CTD screening method	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	1x/week	10 working days	PER-PAT 301	
15.	Anti-nuclear antibody (ANA) - IF method	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	1x/week	14 working days	PER-PAT 301	Further test of ANA (CTD) or if clinically indicated
16.	Anti-smooth muscle antibody (ASMA)/ Anti-mitochondrial antibody (AMA)/ Anti-liver kidney microsomal antibody (LKM)	Mikro	Plain gel tiub	Serum	3.5ml	Send immediately to the lab	Run in batches	14-21 working days	PER-PAT 301	
17.	Antistreptolysin O Titer (ASOT)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	3 days	PER-PAT 301	
18.	Aspartate Transaminase (AST)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
19.	Beta-Human Chorionic Gonadotrophin (β -HCG)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
20.	Bilirubin total / direct	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours Urgent: 1 hour	PER-PAT 301	
21.	Blood Film for Malaria Parasite	Mikro	Smear	Blood	-	Send	Daily	24 hours	PER-PAT	According to standard

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
	(BFMP)					immediately to the lab		after stain	301	
22.	Blood gas (pH,pO ₂ ,pCO ₂)	PK	Heparin syringe	Blood	1ml	Send immediately to the lab	Daily	1 hour	PER-PAT 301	Specimen should be sent with slurry ice as soon as possible (within 30 minutes) for analysis
23.	Body fluid for cytology	Sito	Plain Container with Yellow Cap, Urine Bag Etc	Urine, Body Fluid (Pleural Fluid, Peritoneal Fluid, Cerebrospinal Fluid (CSF), Pericardial Fluid, Synovial Fluid, Cyst Fluid, Bronchoalveolar Lavage (BAL) etc)	-All body fluid except CSF: >20mL -CSF: As collected	Send immediately to Cytopathology Lab. If delay is anticipated (>12hours), refrigerate at 4oC.	-Office hour (send to Histocytology Lab Counter) -After office hour (send to Department of Pathology Main Counter)	-Urgent: 3 working days (for routine case only) -Normal case: 7 working days	PER-PAT 301	
24.	Body Fluids Biochemistry (protein, cell count)	PK	Specimen container	Fluid	20ml	Send immediately to the lab	Daily	1 working day	PER-PAT 301	
25.	Bone Marrow Aspiration & Trephine biopsy	Hema	Smear	BMA	-	Send immediately to the lab	By appointment	7 working days	PER-PAT 301	Clinical summary is compulsory
26.	Brushing (Bronchial brushing, CBD brushing)	Sito	Dry Fixed Smear Slide	Bronchial, Common Bile Duct (CBD)	-	Send immediately to Cytopathology Lab. Keep in room temperature.	Office hour	-Urgent: 3 working days (for routine case only) -Normal case: 7 working days	PER-PAT 301	
27.	CA 125	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
28.	CA 19-9	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
29.	Carcinoembryonic Antigen (CEA)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
30.	Cholesterol	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
31.	<i>Clostridium difficile</i> toxin A & B	Mikro	Sterile container	Stool	-	Send immediately to the lab	Working day	1 working day	PER-PAT 301	
32.	CM • Calcium • Magnesium • Phosphate	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
33.	Coagulation profile	Hema	-	--	-	Send immediately to the lab	-	-	-	Please refer APTT and PT test
34.	Coombs test (Direct/Indirect)	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	≤24 hours	PER-PAT 301	2 copies of request form
35.	Cortisol	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
36.	COVID-19 (SARS-CoV-2) GeneXpert	Mikro	VTM	NPS	-	Send immediately to the lab	Working day	1 working day	HTF/PL/MIK/B18	*Please request for kit *Send in ice
37.	COVID-19 Rapid Test Kit Antigen (RTKAg)	Mikro	RTKAg Kit	NPS	-	Send immediately to the lab	Daily	1 hour	HTF/PI/MIK/B17	*Please request for kit *Send in ice
38.	C-reactive Protein (CRP)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	4 hours	PER-PAT 301	
39.	Creatine Kinase (CK)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
40.	Creatine Kinase-MB (CKMB)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
41.	Creatinine	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
42.	Culture & Sensitivity (C&S) Blood (Bakteria)	Mikro	Blood culture bottle (Aerobic/ Anaerobic/ Peds)	Blood (For cases of suspected Catheter-Related Bloodstream Infection (CRBSI), please send samples from Central and Peripheral lines at the same time)	Adult:5-10ml Paed:1-3ml	Send immediately to the lab	Daily	5 days	PER-PAT 301	*Take sample before antibiotic treatment and when temperature spike *Take aseptically to avoid contamination of the skin normal flora *DO NOT refrigerate *Take 2 sets of specimens from different puncture sites at different time intervals for of septicemia cases *Take 3 sets for IE cases *Preliminary result is available after 2 days *Note time of sample taken
43.	Culture & Sensitivity (C&S) Blood (Fungus)	Mikro	Blood culture bottle (Myco/F Lytic/ Aerobic)	Blood	3-10ml	Send immediately to the lab	Daily	14 days	PER-PAT 301	*Take sample before antibiotic treatment and when temperature spike *Take aseptically to avoid contamination of the skin normal flora *DO NOT refrigerate *Take 2 sets of specimens from different puncture sites at different time intervals for of septicemia cases *Take 3 sets for IE cases *Preliminary result is available after 2 days *Note time of sample

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
										taken
44.	Culture & Sensitivity (C&S) Blood (MTB- <i>Mycobacterium tuberculosis</i>)	Mikro	Blood culture bottle (Myco/F Lytic)	Blood	3-10ml	Send immediately to the lab	Daily	42 days	PER-PAT 301	
45.	Culture & Sensitivity (C&S) Body fluid Eg: Pericardial/ Pleural/ Peritoneal/ Synovial	Mikro	Sterile Bijou bottle Anaerobe: RCMM	Fluid	5ml	Send immediately to the lab	Daily	5 days	PER-PAT 301	
46.	Culture & Sensitivity (C&S) Bone	Mikro	Sterile container Anaerobe: RCMM	Bone	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
47.	Culture & Sensitivity (C&S) Cerebrospinal fluid (CSF) (Other test can be requested: Gram stain, AFB stain, Indian Ink, Bacterial antigen)	Mikro	Sterile Bijou bottle (x5)	CSF	1ml per container (if the volume is less than 0.5ml, culture test will be made first)	Send immediately to the lab	Daily	5 days	PER-PAT 301	*Please send to Unit Patologi Kimia after office hour *DO NOT refrigerate
48.	Culture & Sensitivity (C&S) Ear discharge / pus swab	Mikro	Amies	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
49.	Culture & Sensitivity (C&S) Endocervical	Mikro	Amies/ Amies with charcoal	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	<i>N.gonorrhoeae</i> isolation
50.	Culture & Sensitivity (C&S) Eye discharge / pus swab	Mikro	Amies	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
51.	Culture & Sensitivity (C&S) Fungal Culture	Mikro	Sterile Bijou Bottle/ Sterile container	Skin/ Nail/ Hair/ Pus/ Tissue	-	Send immediately to the lab	Daily	14-28 days	PER-PAT 301	Wash with 70% alcohol or get media from laboratory
52.	Culture & Sensitivity (C&S) Genital swab	Mikro	Amies/ Amies with charcoal	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
53.	Culture & Sensitivity (C&S) High Vaginal Swab (HVS)	Mikro	Amies/ Amies with charcoal	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
54.	Culture & Sensitivity (C&S) Low Vaginal Swab (LVS)	Mikro	Amies/ Amies with charcoal	Swab	-	Send immediately to	Daily	5 days	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
						the lab				
55.	Culture & Sensitivity (C&S) Nasopharynx / Nasal swab	Mikro	Sterile swab/ Amies	-	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	*Wet the sterile swab with saline before taking the specimen * Please use one swab for both right and left nasal
56.	Culture & Sensitivity (C&S) Pus	Mikro	Sterile Bijou Bottle/ Sterile container Anaerobe: RCMM	Pus	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	Debridement must be done first
57.	Culture & Sensitivity (C&S) Pus-Eye	Mikro	Amies/ Smear on slide (Gonococci)	Pus	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	Use Amies media if Gonococci (GC) are suspected
58.	Culture & Sensitivity (C&S) Sputum	Mikro	Sterile container	Sputum	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	Specimens to be taken early in the morning
59.	Culture & Sensitivity (C&S) Sterility Testing	Mikro	Sterile container	Accordingly	5ml	Send immediately to the lab	Daily	5 days	PER-PAT 301	
60.	Culture & Sensitivity (C&S) Stool	Mikro	Stool container	Stool	2-3ml	Send immediately to the lab	Daily	7 days	PER-PAT 301	
61.	Culture & Sensitivity (C&S) Swab	Mikro	Cary blair/ Amies	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
62.	Culture & Sensitivity (C&S) Throat swab	Mikro	Amies /Swab	-	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	Take sample before antibiotic treatment
63.	Culture & Sensitivity (C&S) Tissue	Mikro	Sterile container Anaerobe: RCMM	Tissue	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	Debridement must be done first
64.	Culture & Sensitivity (C&S) Urethral (Male)	Mikro	Sterile swab/ Amies/ Amies with charcoal	Swab	-	Send immediately to the lab	Daily	5 days	PER-PAT 301	
65.	Culture & Sensitivity (C&S) Urine	Mikro	Sterile container/ urine culture	Urine	15ml	Send immediately to	Daily	5 days	PER-PAT 301	Early morning specimen is highly recommended

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
			bottle (boric acid)			the lab				
66.	D-Dimer	Hema	Trisodium citrate	Blood	Adult:1.8ml Paed:1ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	Clinical summary is needed
67.	Dengue Antibody (IgM/IgG)/ NS1-Antigen (NS1)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	24 hours	PER-PAT 301	
68.	Drug of abuse • Opiate, Cannabinoid	PK	Universal bottle	Urine	10ml	Send with seals	Office hour	3 working days		Screening
69.	Drug of abuse • Morphine, THC	PK	Universal bottle	Urine	10ml	Send with seals	Office hour	5 working days		Confirmation
70.	Endocrinology • Cortisol • Free Thyroxine (FT4) • Free Triiodothyronine (FT3) • Thyroid Stimulating Hormone (TSH)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
71.	Erythrocyte Sedimentation Rate (ESR)	Hema	Esr tube	Blood	1.2ml	Send immediately to the lab	Daily	2 hours	PER-PAT 301	
72.	Estradiol/Oestradiol	PK	Plain gel tube	Blood	3.5ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
73.	Extractable nuclear antigen (ENA)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab		14 working days		
74.	Factor IX Assay	Hema	Trisodium citrate	Blood	1.8 ml (x2)	Send immediately to the lab	Office hour	Normal: 3-7 days Urgent: 1-2 days	PER-PAT 301	Time dependant test -Clinical Summary is needed -Must do an appointment by ward/clinic
75.	Factor VIII + IX Inhibitor level	Hema	Trisodium citrate	Blood	1.8ml (x3)	Send immediately to the lab	Office hour	Normal: 3-7 days Urgent: 1-2 days	PER-PAT 301	Time dependant test -Clinical Summary is needed -Must do an

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
										appointment by ward/clinic
76.	Factor VIII Assay	Hema	Trisodium citrate	Blood	1.8 ml (x2)	Send immediately to the lab	Office hour	Normal: 3-7 days Urgent: 1-2 days	PER-PAT 301	Time dependant test -Clinical Summary is needed -Must do an appointment by ward/clinic
77.	Fasting Lipid Profile (FLP) • Cholesterol • Triglyceride (TG) • High-density lipoprotein (HDL) • Low-density lipoprotein (LDL)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
78.	Ferritin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
79.	Fertility test • Beta-Human Chorionic Gonadotrophin (β -HCG) • Estradiol/Oestradiol • Follicle Stimulating Hormone (FSH) • Luteinizing Hormone (LH) • Progesterone • Prolactin • Testosterone	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
80.	Fibrinogen	Hema	Trisodium citrate	Blood	Adult:1.8ml Paed:1ml	Send immediately to the lab	Office hour	4 hours	PER-PAT 301	Clinical Summary is needed
81.	Filaria	Mikro	Smear	Blood	-	Send immediately to the lab	-	1 day	PER-PAT 301	Blood has to be taken after 9pm
82.	Fine-needle Aspiration Cytology (FNAC)	Sito	Dry Fixed Smear Slide, Dry Smear Slide, Fluid in Container Etc	Organ Lesional	-	Send immediately to Cytopathology Lab. All slides	Office hour	-Urgent: 3 working days (for routine)	PER-PAT 301	All FNAC case should have rapid on-site examination (ROSE). Only trained aspirators

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
						are kept in room temperature. If delay is anticipated (>12hours), refrigerate fluid in container at 4°C.		case only) -Normal case: 7 working days		can perform aspiration.
83.	Follicle Stimulating Hormone (FSH)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
84.	Free Thyroxine (FT4)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	3 working days	PER-PAT 301	
85.	Free Triiodothyronine (FT3)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
86.	Full Blood Count (FBC)	Hema	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	2 hours Urgent: 45 min	PER-PAT 301	
87.	Full Blood Picture (FBP)	Hema	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	7 working days Urgent: 3 working days	PER-PAT 301	Clinical Summary is needed
88.	Globulin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
89.	Glucose (*GOD-PAP)	PK	Sodium flouride/na2 edta	Blood	3ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
90.	Glucose-6-Phosphate Dehydrogenase (G6PD)	Hema	Filter paper whatman no.1	Blood	-	Send immediately to the lab	Daily	24 hours	PER-PAT 301	Droplet size measures the ceiling 20 cents


No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
91.	GSH (Group, Screen & Hold)	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	≤4 hours	PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	
92.	GXM (Crossmatching/ Compatibility testing) • Paeds < 4 mths old	BB	EDTA	Blood	Mother:6ml Baby:0.5ml	Send immediately to the lab	Daily	Full GXM: ≤2 hours Saline phase GXM: ≤30 min Safe O: ≤5 min	PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	The child's sample must be sent together with the mother's sample in a form
93.	GXM (Crossmatching/ Compatibility testing) • Paeds > 4 mths old	BB	EDTA	Blood	2 ml	Send immediately to the lab	Daily	Full GXM: ≤2 hours Saline phase GXM: ≤30 min Safe O: ≤5 min	PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	
94.	GXM (Crossmatching/ Compatibility testing) • Thalassaemia cases	BB	EDTA	Blood	6 ml	Send immediately to the lab	Clinic day (Thursday)	Clinic day	PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	State the type of blood group
95.	GXM (Crossmatching/ Compatibility testing)	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	Full GXM: ≤2 hours Saline phase GXM: ≤30 min Safe O: ≤5 min	PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017)	
96.	Gynaecology fluid (Pap smear)- Conventional method	Sito	Dry (Alcohol) Fixed Smear	Cervix, Vault	-	Send immediately to	Office hour	14 days	PS 1/98 (Pindaan	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
			Slide			Cytopathology Lab. All slides are kept in room temperature			2007)	
97.	Hb analysis	Hema	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Run in batches	6 weeks	PER-PAT 301	Clinical summary is needed
98.	Hemoglobin A1c (HbA1c) *HPLC	PK	K2 edta	Blood	2ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
99.	Hepatitis B Surface Antibody (Anti-HBs/HBsAb) Screening	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	2x/week	5 days	PER-PAT 301	
100.	Hepatitis B Surface Antigen (HBsAg) Screening	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	2x/week	5 days	PER-PAT 301	
101.	Hepatitis C antibody (Anti-HCV)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	2x/week	5 days	PER-PAT 301	
102.	High-Density Lipoprotein (HDL)	PK	Plain gel tube	Blood	3.5ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
103.	Histochemical (HC) stain	Histo/ Sito	Tissue Block, Unstained Slides (2 Slides).	Formalin Fixed Paraffin Embedded Tissue	-	All slides are kept in room temperature	Office hour	3 working days	-PER-PAT 301 for internal case -Request letter for external case	Applicable for materials from external source only.
104.	Histopathology Examination (HPE)	Histo	Suitable Container With 10% Formalin	Human Tissue	Any tissue volume with formalin more than 10x the volume	Send immediately to Histopathology Lab. All specimens (in formalin) are kept at room temperature. If delay suspected for big specimen	Office hour	Urgent: 3 working days (for routine case only) Others: 14 days	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
						(>1 day), slice the specimen under pathology staff guidance/supervision.				
105.	Human Immunodeficiency Virus Antibody (Anti-HIV)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	2x/week	4 days	PER-PAT 301	
106.	Immunohistochemical (IHC) stain	Histo/Sito	Tissue Block, Unstained Slides (2 Slides).	Formalin Fixed Paraffin Embedded Tissue	-	All slides are kept in room temperature	Office hour	3 working days	-PER-PAT 301 for internal case -Request letter for external case	Applicable for materials from external source only.
107.	Iron	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	3 working days	PER-PAT 301	
108.	Lactate	PK	Sodium flouride/Na2 EDTA	Blood	2ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	Send in ice
109.	Leptospira antibody	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	1 day	PER-PAT 301	
110.	Liver Function Test (LFT) • Alanine Transaminase (ALT) • Albumin • Alkaline phosphatase (ALP) • Aspartate Transaminase (AST) • Bilirubin total • Globulin • Protein total	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
111.	Low-Density Lipoprotein (LDL)	PK	Plain gel tube	Blood	3.5ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
112.	Luteinizing Hormone (LH)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to	Tuesday & Thursday	3 working days	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
						the lab				
113.	Magnesium (Xylidyl Blue)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
114.	Malaria Rapid Test	Mikro	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	1 hour	PER-PAT 301	Rapid test only
115.	Mycoplasma Serology	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	5 working days	PER-PAT 301	
116.	Osmolality (Serum)	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
117.	Osmolality (Urine)	PK	Urine container	Urine	2ml	Send immediately to the lab	Daily	1 working day	PER-PAT 301	
118.	Osmotic Fragility Test (OFT)	Hema	Heparinised tube	Blood	5ml	Send immediately to the lab	By appointment	3 days	PER PAT 301	Sample receipt is in the morning only
119.	Ova and cyst	Mikro	Stool container	Stool	-	Send immediately to the lab	Working day	24 hours	PER-PAT 301	
120.	Phosphate	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
121.	Potassium	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
122.	Progesterone	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
123.	Prolactin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
124.	Prostate Specific Antigen (PSA) total	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
125.	Protein total	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
126.	Prothrombin Time (PT)	Hema	Trisodium citrate	Blood	Adult:1.8ml Paed:1ml	Send immediately to the lab	Daily	2 hours Urgent: 1 hour	PER-PAT 301	
127.	Red Cell Phenotyping	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Working day	≤1 week	PER-PAT 301	*2 copies of request form *Test application needs to be discussed with on-call Transfusion Medical Officer
128.	Renal Profile (RP) • Creatinine • Potassium • Sodium • Urea	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
129.	Respiratory Virus Antigen (Influenzae A&B/ Adenovirus/ RSV)	Mikro	Sterile swab	NPS/ NPA	-	Send immediately to the lab	Working day	1 working day	PER-PAT 301	
130.	Retic Count	Hema	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Office hour	1 day	PER-PAT 301	
131.	Rhesus Antigen Typing	BB	EDTA	Blood	Adult:2ml Paed:0.5ml	Send immediately to the lab	Daily	30 minutes	PER-PAT 301	
132.	Rheumatoid factor	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	3 days	PER-PAT 301	
133.	Rotavirus	Mikro	Stool container	Stool	-	Send immediately to the lab	Working day	24 hours	PER-PAT 301	
134.	Seminal Fluid Analysis	Sito	Plain Container with Yellow Cap	Freshly taken seminal fluid	-No sexual intercourse at	Send immediately to	Office hours (8-11am only)	3 working days	PER-PAT 301	The patient is encourage to get an appointment

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
					least 3 days prior to sampling. -Empty the bladder. - Technique of sampling: masturbation without the use of aids such as condom.	Cytopathology Lab within ½ hour of sampling.				through google form at link https://forms.gle/3AaLxy5RLHp7VoUT9 or scan the QR code given below 
135.	Slit Skin Smear (SSS) for <i>Mycobacterium leprae</i> (Calitan Torehan Kulit Kusta)	Mikro	Slaid	Slit skin	-	Send immediately to the lab	Daily	24 hours working days	LIS 102A	*Store slides at room temperature * DO NOT refrigerate
136.	Sodium	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
137.	Sputum cytology	Sito	Plain Container with Yellow Cap	Sputum	As collected	Send immediately to Cytopathology Lab. If delay is anticipated (>12hours), refrigerate at 4oC.	Office hour	-Urgent: 3 working days (for routine case only) -Normal case: 7 working days	PER-PAT 301	
138.	Sputum cytology	Sito	Dry Fixed Smear Slide	Sputum	-	Send immediately to Cytopathology Lab. Kept in room temperature.	Office hour	-Urgent: 3 working days (for routine case only) -Normal case: 7 working days	PER-PAT 301	
139.	Substitution Test / Mixing Test	Hema	Trisodium citrate	Blood	1.8ml x 2tube	Send immediately to the lab	Office hour	1-3 days	PER-PAT 301	Please make an appointment by phone before sending the

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
										specimen
140.	TDM-Acetaminophen	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
141.	TDM-Amikacin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
142.	TDM-Carbamazepine	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
143.	TDM-Digoxin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
144.	TDM-Gentamicin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 jam Rutin TDM: Working day Hujung minggu: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
145.	TDM-Phenobarbital	PK	Lithium heparin	Blood	Adult:1.8ml Paed:1ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
146.	TDM-Phenytoin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
147.	TDM-Theophylline	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
148.	TDM-Valproic acid	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
149.	TDM-Vancomycin	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Toxicology: 24 hours Routine TDM: Working day Weekend: 8am-1pm	4 hours Urgent: 2 hours	TDM Request form	A copy of request form is kept in the laboratory
150.	Testosterone	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
151.	Thyroid Stimulating Hormone (TSH)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	3 working days	PER-PAT 301	
152.	Transfusion Reaction • Post transfusion 1 take immediately after reaction occur • Post transfusion 2 take 24 hours after onset of reaction	BB	Refer Transfusion Reaction Kit	Blood, Urine with Blood Bag & Blood Giving Set	Refer Transfusion Reaction Kit	Send immediately to the lab	Daily	≤14 days	Refer Transfusion Reaction Kit	Get the Transfusion Reaction Kit from Blood Bank
153.	<i>Treponema pallidum</i> Particle Agglutination (TPPA)	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Run in batches	5 working days	PER-PAT 301	Further test for RPR/VDRL
154.	Triglycerides	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
155.	Troponin I	PK	EDTA	Blood	Adult: 2ml Paed: 0.5ml	Send immediately to the lab	Daily	1 hour	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
156.	Tumour marker test • CA 125 • CA 19-9 • Carcinoembryonic Antigen (CEA) • Prostate Specific Antigen (PSA) total	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301	
157.	Tzank test	Sito	Dry Smear Slide	Infected Blister	-	Send immediately to Cytopathology Lab. Kept in room temperature.	Office hour	-Urgent: 3 working days (for routine case only) -Normal case: 7 working days	PER-PAT 301	
158.	Unbound-iron binding capacity (UIBC)	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Run in batches	3 working days	PER-PAT 301	
159.	Urea	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
160.	Uric acid	PK	Lithium heparin	Blood	Adult:4ml Paed:0.8ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
161.	Urine Albumin to Creatinine Ratio (ACR)	PK	Plain container	Urine	20ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
162.	Urine chemistry	PK	Urine container	Urine	20ml	Send immediately to the lab	Daily	1 working day	PER-PAT 301	
163.	Urine Diastase /Amylase	PK	Urine container	Urine	10ml	Send immediately to the lab	Weekday: 8am-5pm Weekend: 8am-1pm	4 hours	PER-PAT 301	
164.	Urine Full Examination, Microscopic Examination (FEME) - strip	PK	Urine container	Urine	20ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT	FORM	NOTES
165.	Urine Paraquat	PK	Urine container	Urine	20 ml	Send immediately to the lab	Daily	1 hour	PER-PAT 301	
166.	Urine Pregnancy Test (UPT)	PK	Urine container	Urine	20ml	Send immediately to the lab	Daily	4 hours	PER-PAT 301	
167.	VDRL/RPR – Screening test for Syphilis	Mikro	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Daily	3 days	PER-PAT 301	Please request VDRL/RPR test separately from infective screening test (HBsAg, Anti-HBs/HBsAb, Anti-HCV, Anti-HIV)

**SENARAI UJIAN DI JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS YANG DIHANTAR KE MAKMAL
RUJUKAN LUAR
(MENGIKUT SUSUNAN ABJAD)**

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
1	17-OH Progesterone (17-Hydroxy Progesterone)	PK	Plain gel tube	Serum	3.5ml	Store in freezer or at 2-8°C during transporting	Tuesday & Thursday	20 working days	PER-PAT 301		IMR-ENDO	To be counter signed by specialist
2	2 nd Opinion (Breast Endocrine)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HUSM	
3	2 nd Opinion (Git Liver)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HSB	
4	2 nd Opinion (Lymphoreticular)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HRPB	
5	2 nd Opinion (Oral)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HSAH	
6	2 nd Opinion (Skin Non-tumour)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	42 days	PER-PAT 301 (Copy)		HSJ	
7	2 nd Opinion (Skin-tumour)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		UPM	
8	2 nd Opinion (Soft Tissue)	Histo/ Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HKL	
9	5-Hydroxy-indol acetic acid (5-HIAA), urine (random)	PK	24 hours urine container (10ml 25% HCL)	24 hours urine	>750ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	*To get container from lab *To be counter signed by specialist
10	Acid α -Glucosidase (POMPE), blood spot	PK	Dried blood spot (DBS)	Blood spot	3 circles of DBS	Send together with plasma sample	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	To be counter signed by specialist
11	Adenocorticotrophic Hormone (ACTH)	PK	Plain gel tube	Serum	3.5ml	Put in ice once blood drawn and send to the lab	Tuesday & Thursday	5 working days	PER-PAT 301	NA	HKL	To be counter signed by

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
						immediately. Use cold centrifuge to separate the plasma. Keep in freezer -20°C and send to the referral lab in ice packs.						specialist
12	Adenovirus PCR	Mikro	Sterile container	NPA/ NPS/ Throat swab/ Throat gargle/ BAL/ Sputum/ Nasal swab/ Organ biopsy	NA	Send immediately to the lab	Tuesday & Thursday	28 working days	PER-PAT 301		IMR-VIRO	Transport at 2-8°C
13	Alcohol (Ethanol)	PK	Plain gel tube	Serum	3.5ml	Put in ice once blood drawn and send to the lab immediately. Use cold centrifuge to separate the plasma. Keep in freezer -20°C and send to the referral lab in ice packs.	Tuesday & Thursday	2 working days	PER-PAT 301		HKL	To be counter signed by specialist
14	Aldosterone	PK	EDTA	Plasma	Adult: 3ml Paed: 1ml	Send immediately to the lab	Tuesday & Thursday	21 days	PER-PAT 301		HPJ	To be counter signed by specialist-Endocrinologist/ Paediatrician
15	Alpha-1-Antitrypsin (Phenotyping)	PK	Plain gel tube	Serum	3.5ml	Serum must reach the lab not more than 7 days (at 2-8°C) after collection date	Tuesday & Thursday	20 working days	IMR.SDC.U PK		IMR-MD	To be counter signed by specialist
16	Alpha-1-Antitrypsin	PK	Plain gel	Serum	3.5ml	Send immediately	Tuesday &	7 working	PER-PAT		HA	To be

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(Quantitation)		tube			to the lab	Thursday	days	301			counter signed by specialist
17	Alpha-1-Glycoprotein (Orosomucoids)	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HA	To be counter signed by specialist
18	Alpha-2-Macroglobulin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HA	To be counter signed by specialist
19	Amino Acid, CSF	PK	Universal bottle (Gold Cap)	CSF	1ml	To be sent together with plasma sample	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	To be counter signed by specialist
20	Amino Acid, Plasma	PK	Heparin	Plasma	2ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	To be counter signed by specialist
21	Amino Acid, Urine (Quantation by HPLC)	PK	Sterile container	Urine	5ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	*Appointment needed * To be counter signed by specialist
22	Amoebic PCR	Mikro	EDTA Sterile container	Blood Pus/ Aspirate/ Biopsy/ Scraping	2.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		IMR-PARA	Send sample in ice
23	Amoebic Serology	Mikro	EDTA Plain gel tube	Blood Serum	2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-PARA	Send sample in ice
24	Anti-Acetylcholine Receptor Antibody (ACR)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	21 working days	IMR/AIRC/ Autoimmune/RF		IMR-AIRC	
25	Anti-Aquaporin 4	Mikro	Plain gel	Blood/ Serum	5ml	Send immediately	Tuesday &	10 working	IMR/AIRC/		IMR-AIRC	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(Anti-Aq4)		tube Bijou bottle	CSF		to the lab	Thursday	days	Autoimmun e/RF			
26	Anti-Beta 2- Glycoprotein-1 (Anti-Phospholipid Syndrome-APS)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
27	Antibody Identification (PDN-full report)	BB	EDTA	Blood	6ml	Send immediately to the lab	Working day	10 working days	PER-PAT 301		PDN	To get Antibody Identification Kit from Blood Bank
28	Antibody Identification (PDN-full report)	BB	Plain Tube	Blood	10ml	Send immediately to the lab	Working day	10 working days	PER-PAT 301		PDN	To get Antibody Identification Kit from Blood Bank
29	Anti-Cardiolipin Antibody (ACL) IgM/IgG (Anti- Phospholipid Syndrome-APS)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
30	Anti-Cyclic Citrullinated Protein (CCP/ACPA)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
31	Anti-Fungal Susceptibility Testing	Mikro	Media that support growth	Fungal isolate	NA	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	*Identify the fungus first and results sent together with pure isolate and clinical history *Transport condition: ambient temperature

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												*Attach any preliminary test results
32	Anti-Ganglioside Antibodies 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)	Mikro	Plain gel tube Bijou bottle	Blood/ Serum CSF	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
33	Anti-Glomerular Basement Membrane (GBM)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
34	Anti-Neutrophil Cytoplasmic Antibody (ANCA) Panel (Anti-MPO, Anti-PR3)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	21 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
35	Anti-N-Methyl-D-Aspartate Receptor (NMDAR)	Mikro	Plain gel tube Bijou bottle	Blood/ Serum CSF	5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
36	Anti-Thyroglobulin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HPP	* To be counter signed by specialist * Minimum re-testing interval: 6 months
37	Anti-Thyroid Receptor Antibodies	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	PER-PAT 301		HKL	To be counter signed by

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												specialist
38	Anti-Thyroid Specific Peroxidase	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HPP	To be counter signed by specialist
39	<i>Aspergillus fumigatus</i> antibody/Serum Galactomannan	Mikro	Plain gel tube	Blood	3ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
40	Atypical Mycobacterium infection or Mycobacteria other than Tuberculosis (MOTT) PCR	Mikro	Sterile container	Sputum/ Pus/ CSF/ Body fluid	CSF: 1-2ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/IDRC/ BACT/TB/01		IMR-BAC	*CSF : send to lab immediately *Sputum : ideally collect 3 consecutive specimens. A single well collected specimen is adequate.
41	Bacterial Antigen	Mikro	Sterile container	CSF	1-3ml	Send immediately to the lab	Tuesday & Thursday	1 day	PER-PAT 301		HSB	Only done when CSF cell count is more than normal value
42	Bacterial Identification (Aerobic)	Mikro	Media that support growth	Pure bacterial isolate	NA	Send immediately to the lab	Tuesday & Thursday	20 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	
43	Bacterial Identification (Anaerobic)	Mikro	Media that support growth	Pure bacterial isolate	NA	Send immediately to the lab	Tuesday & Thursday	30 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	
44	Beta-2-microglobulin	PK	Plain gel tube	Serum	3.5ml	Serum must reach the lab not more than 7 days (at 2-8°C) after collection date	Tuesday & Thursday	5 working days	IMR.SDC.U PK		IMR-MD	To be counter signed by specialist

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
45	BMA Cytogenetics	Hema	Lithium Heparin	Peripheral blood/ BMA	Peripheral blood: 10ml BMA: 2ml	Send immediately to the lab	Tuesday & Thursday	18 working days	BMA cytogenetics Form		HPP	Packed on ice, send within 24 hours
46	<i>Bordetella pertussis</i> -DNA PCR	Mikro	Sterile container	NPA/ NPS (Dacron Swab Sahaja)	NPA: 1-2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IMR/BACT/FORMS/SM IS/01		IMR-BAC	*For NPS do not use calcium alginate or cotton swabs *Transport NPA in ice
47	Brucella Serology-Antibody Detection	Mikro	Plain gel tube	Serum	2ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/BACT/FORMS/SM IS/01		IMR-BAC	Transport at 2-8°C
48	<i>Burkholderia pseudomallei</i> (Meloidosis) Serology-Antibody Detection (IgM)	Mikro	Plain gel tube	Serum	2-3ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IMR/BACT/FORMS/SM IS/01		IMR-BAC	Transport at ambient temperature; if delayed keep at 2-8°C
49	Caeruloplasmin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HA	To be counter signed by specialist
50	Calcitonin	PK	Plain gel tube	Serum	Adult: 3.5ml Paed: 1ml	Send immediately to the lab	Tuesday & Thursday	1 month	PER-PAT 301		IKN	To be counter signed by specialist
51	CA-MRSA PCR (Detection of Vancomycin Resistant Genes-mecA, PVL)	Mikro	Media that support growth	Pure bacterial culture	NA	Send immediately to the lab	Tuesday & Thursday	7 working days	IMR/BACT/FORMS/SM IS/01		IMR-BAC	Send pure isolates with clinical history
52	Carbapenemase Genes Detection -	Mikro	BA/ NA slant	Pure bacterial culture	NA	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/BACT/FORMS/SM		IMR-BAC	Send patient history with

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Carbapenem Resistance Enterobacteriaceae (CRE)								IS/01			preliminary antibiotic susceptibility test results
53	Carnithine-Acylcarnitine Translocase Deficiency (SLC25A20)	PK	EDTA Blood spot paper	Blood Dried blood spot	1-2 x 2.5ml blood in EDTA or Dried blood spot	Transport in ambient air. If >3 hours, keep in 2-8°C. Avoid freezing.	Tuesday & Thursday	3 months	IEM Form		IMR-BIO	To be counter signed by specialist
54	Carnitine Total and Free, Plasma	PK	Heparin	Plasma	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IEM Form		IMR-BIO	To be counter signed by specialist
55	Cathecolamines, Urine	PK	24 hours urine container (10ml 25% HCL)	24 hours urine	Adult: >500ml Paed: <750ml Will be treated as random urine samples	Send immediately to the lab	Tuesday & Thursday	20 working days	PER-PAT 301		HKL	*To get container from lab *To be discussed with specialist *To be counter signed by specialist
56	CD4/CD8	Hema	EDTA	Blood	2ml	Send immediately to the lab	Monday	3-5 working days	PER-PAT 301		HSB	
57	Chikungunya Virus PCR	Mikro	Plain gel tube	Serum	1-3ml	Send immediately to the lab	Tuesday & Thursday	3 days	MKAK-BPU-U01		MKAK	*Sample should be collected within 5 days after onset of illness *Transport at 2-8°C

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
58	Chikungunya Virus Serology (IgM/IgG)	Mikro	Plain gel tube	Serum	1-3ml	Send immediately to the lab	Tuesday & Thursday	24 hours	MKAK-BPU-U01		MKAK	*Sample should be collected within 5 days after onset of illness *Transport at 2-8°C
59	Chlamydia Serology-Antibody Detection	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
60	Cholinesterase	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HSB	To be counter signed by specialist
61	Chromosome Study (Blood Cytogenetics)	Hema	Lithium Heparin	Blood	3-5ml	Send immediately to the lab	Tuesday & Thursday	Urgent: 10 working days Routine: 60 working days	Cytogenetics Request Form		HTA	*By appointment only *Packed in ice, send within 24 hours
62	Classical Galactosemia (GALT)	PK	Blood spot paper (Contact lab)	Dried blood spot	NA	Transport in ambient air. If >3 hours, keep in 2-8°C. Avoid freezing.	Tuesday & Thursday	3 months	IEM Form		IMR-BIO	To be counter signed by specialist
63	CMV-DNA (Qualitative)-PCR	Mikro	EDTA/Plain gel tube Sterile container	Blood CSF/ Tissue biopsy/ BAL	Blood: 5ml CSF: min 0.3ml	Send immediately to the lab	Tuesday & Thursday	3 days	PER-PAT 302		HSgB	
64	CMV-DNA (Quantitative)-PCR	Mikro	EDTA/Plain gel tube Sterile container	Blood CSF/ Tissue biopsy/ BAL	Blood: 5ml CSF: min 0.3ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
65	Coeliac Antibody Panel	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	21 working days	IMR/AIRC/ Autoimmun		IMR-AIRC	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(Anti-Endomysium, Anti-Gliadin, Anti-Tissue Transglutaminase)								e/RF			
66	Complement : C3,C4	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HSB	To be counter signed by specialist
67	Copper, Serum	PK	Plain gel tube	Serum	3.5ml	Samples must be collected using an appropriate container, free of heavy metal or trace elements.	Tuesday & Thursday	14 working days	PER-PAT 301		IMR-TOF	To be counter signed by specialist
68	Copper, Urine	PK	24 hours urine container without preservative	24 hours urine	>750ml	Samples must be collected using an appropriate container, free of heavy metal or trace elements.	Tuesday & Thursday	14 working days	PER-PAT 301		IMR-TOF	* To be counter signed by specialist * To get container from lab
69	Cortisol, Urine	PK	24 hours urine container without preservative	24 hours urine	>750ml	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		HKL	*To be counter signed by specialist *To get container from lab
70	COVID-19 (SARS-CoV-2) PCR	Mikro	VTM/Sterile container	NPS/ OPS/ TA	NA	Send immediately to the lab	Tuesday & Thursday	2 days	COVID-19 PCR Form		HSB	Send in ice
71	COVID-19 Genome Sequencing	Mikro	VTM	NPS/OPS	NA	Send immediately to the lab	Tuesday & Thursday	-	PER-PAT 301		IMR-VIRO	
72	COVID-19 Serology	Mikro	Plain gel tube	Blood/ Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	1 working day	PER-PAT 301		IMR-VIRO	
73	COVID-19 Virus Culture (Viral	Mikro	Sterile container	NPS/Throat swab/Nasal	NA	Send immediately to the lab	Tuesday & Thursday	28 working days	PER-PAT 301		IMR-VIRO	Transport at 2-8°C

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Isolation Novel Coronavirus)			swab/Organ biopsy								
74	<i>Coxiella burnetii</i> Serology-Antibody Detection	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
75	Coxsackie Virus-RNA PCR	Mikro	Plain gel tube Sterile container/ VTM	Serum Mouth ulcer swab/ Vesicle swab/ Stool/ Rectal swab/ Throat swab/ Pleural fluid/ CSF/ Tissue biopsy	Stool: 5g Pleural fluid, CSF, Serum: 1-3ml Tissue biopsy: 1.5cm ²	Send immediately to the lab	Tuesday & Thursday	3 days	PER-PAT 301		IMR-VIRO	*Sample should be collected within 5 days after onset of illness *A brief concise history of illness and physical findings is required especially the date of onset of illness and date of sample collection
76	C-Peptide	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HKL	To be counter signed by specialist
77	Cryptococcal Antigen	Mikro	Plain gel tube Sterile container	Blood CSF	Blood: 5ml CSF: 2ml	Send immediately to the lab	Tuesday & Thursday	24 hours	PER-PAT 301		HSB	
78	Cryptosporidium spp., Cyclospora spp. and Isospora spp. (DMSO stain) and	Mikro	Sterile container	Stool	6g	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		IMR-PARA	Fresh stool in plain container (specimen to

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Microsporidium spp. (Gram Chromotrope stain)											reach lab within 24 hours at room temperature)
79	Cryptosporidium-DNA PCR	Mikro	Sterile container/ Cary Blair transport media	Fresh stool/ Rectal swab	2-3 gram (peanut size)	Send immediately to the lab.	Tuesday & Thursday	3 days	PER-PAT 301		MKAK	If delay is unavoidable, please send at 2°C-8°C
80	CSF VDRL	Mikro	Bijou bottle	CSF	2ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
81	Culture Identification/Sensitivity	Mikro	Media that support growth	Pure bacterial isolate	NA	Send immediately to the lab	Tuesday & Thursday	7 days	PER-PAT 301		HSB	
82	Cyclosporine	PK	EDTA	Whole blood	2ml	Send immediately to the lab via hospital portal ONLY	Thursday only	2 working days	TDM Form		HPP	Need consultation with TDM Pharmacist (Ext 8418)
83	Cystine & Homocystine, Urine	PK	Urine container	Random urine	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IEM Form		IMR-BIO	To be counter signed by specialist
84	Cytomegalovirus (CMV) Serology-Antibody Detection (IgM/IgG)	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
85	Dehydro-epiandrosterone Sulphate (DHEAS)	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HKL	To be counter signed by specialist
86	Dengue Virus-RNA PCR	Mikro	Plain gel tube Bijou bottle/ Sterile	Serum CSF/ Tissue biopsy	Serum:3 ml CSF:1ml, Tissue	Send immediately to the lab	Tuesday & Thursday	3 days	MKAK-BPU-D02-rev_Nov_2015		MKAK	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
			container		biopsy:1.5cm cube							
87	Diabetes Antibodies Panel (Anti-Glutamic Acid Decarboxylase (GAD), Anti-Insulinoma-Associated Antigen 2 (IA2) & Anti Islet Cells (ICA))	PK	Plain gel tube	Serum	Adult: 3ml Paed: 1ml	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		IMR-ENDO	To be counter signed by specialist
88	DISH	Histo/Sito	NA	Slides, Blocks	NA	Send in room temperature	Monday-Thursday	5 days	PER-PAT 301 (Copy)		HRPB	
89	DNA Analysis (Thalassemia) Alpha	Hema	EDTA	Blood	2.5ml	Send immediately to the lab	Tuesday & Thursday	120 working days	DNA Analysis request form, Version 3.0		HSB	
90	DNA Analysis (Thalassemia) Beta	Hema	EDTA	Blood	2.5ml	Send immediately to the lab	Tuesday & Thursday	90 working days	DNA Analysis request form, Version 3.0		IMR	
91	Ebola Virus-DNA/RNA PCR	Mikro	After consultation only	After consultation only	After consultation only	Send immediately to the lab	After consultation only	1-5 working days	PER-PAT 301		IMR-VIRO	By consultation only
92	EBV-DNA (Qualitative)-PCR	Mikro	EDTA/Plain gel tube Bijou bottle	Blood CSF	Blood: 5ml CSF: minimal 0.3ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
93	EBV-DNA (Quantitative)-PCR	Mikro	EDTA/Plain gel tube Bijou bottle	Blood CSF	Blood: 5ml CSF: minimal 0.3ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
94	Echinococcosis Serology-Antibody	Mikro	EDTA Plain gel	Blood Serum	2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-PARA	Send sample in ice

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(IgG) Detection (Hydatid Disease)		tube									
95	EGFR/KRAS/ALK	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 month	PER-PAT 301 (Copy)		HTA	
96	Enterovirus RNA-PCR (Inclusive of Pan Entero, EV71 and CA16) (Acute Respiratory Syndrome, Hand, Foot and Mouth Disease, Conjunctivitis, Myocarditis)	Mikro	Sterile container/ VTM	NPA/ NPS/ Throat swab/ Throat gargle/ BAL/ Sputum/ Nasal swab/ Organ biopsy/ Pericardial aspirate/ Rectal swab/ Stool	NA	Send immediately to the lab	Tuesday & Thursday	10 working days	PER-PAT 301		IMR-VIRO	
97	Epstein Barr Virus (EBV) Serology- Antibody Detection (IgM/IgG)	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
98	Erythropoietin Level	Hema	Plain tube	Blood	6ml	Send immediately to the lab	Tuesday & Thursday	60 working days	Hospital Ampang Special Hematology Requisition Form		HA	Packed on ice, send within 24 hours
99	Everolimus	PK	Plain gel tube	Blood	3ml	Send immediately to the lab	Tuesday & Thursday	1 week	PER-PAT 301		HKL	
100	Folate	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HSB	To be counter signed by specialist
101	Fructosamine	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HA	To be counter signed by specialist
102	Fungal-DNA PCR	Mikro	EDTA Sterile container	Blood Body fluid/ CSF/ BAL/	Blood:2 ml Other	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-BAC	For better sensitivity, blood

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
				Tissue biopsy/ Sinus aspirate	samples as much as possible							samplings should be repeated 2 or 3 times, at 3-4 hours interval. Transportaio n at ambient temperature. If delayed keep at 2-8°C
103	G6PD Quantitative	Hema	EDTA	Blood/ Cord blood (Paed)	Adult: 3ml Paed: 1ml	Send immediately to the lab	Tuesday & Thursday	60 working days	Hospital Ampang Special Hematology Requisition Form		HA	*By appointment only * Packed on ice, send within 24 hours
104	Gamma Glutamyl Transferase (GGT)	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	3 working days	PER-PAT 301		HSB	To be counter signed by specialist
105	Growth Hormone	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HKL	To be counter signed by specialist
106	Haptoglobin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HA	To be counter signed by specialist
107	Hepatitis A Virus (HAV) IgG	Mikro	Plain gel tube	Blood	3-5ml	Send immediately to the lab	Tuesday & Thursday	3 days	PER-PAT 301		HKL	
108	Hepatitis A Virus (HAV) IgM	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
109	Hepatitis B Virus	Mikro	Plain gel	Serum	3-5ml	Send immediately	Tuesday &	7 working	PER-PAT		HSB	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(HBV) core IgM (HBc IgM)		tube			to the lab	Thursday	days	301			
110	Hepatitis B Virus (HBV) core Total (HBcT) Antibody	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
111	Hepatitis B Virus (HBV) envelope Antigen (HBeAg)/ Hepatitis B Virus (HBV) envelope Antibody (HBeAb)	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
112	Hepatitis B Virus (HBV)-DNA Viral load (Quantitative) PCR	Mikro	EDTA	Plasma	6ml	Send immediately to the lab	Tuesday & Thursday	4 weeks	PER-PAT 301		HSB	
113	Hepatitis C Virus (HCV) core Antigen	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	Run in batches
114	Hepatitis C Virus (HCV)-Antibody (Immunoblot)	Mikro	Plain gel tube	Blood	3-5ml	Send immediately to the lab	Tuesday & Thursday	14 days	PER-PAT 301		HKL	
115	Hepatitis C Virus (HCV)-RNA Genotyping (Quantitative) PCR	Mikro	Plain gel tube	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	14 days	PER-PAT 301		HKL	
116	Hepatitis C Virus (HCV)-RNA Viral load (Quantitative) PCR	Mikro	EDTA	Plasma	6ml	Send immediately to the lab	Tuesday & Thursday	4 weeks	PER-PAT 301		HSB	
117	Herpes Simplex Virus (HSV) I/Herpes Simplex Virus (HSV) II Serology-Antibody (IgM/IgG) Detection	Mikro	Plain gel tube	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSgB	
118	Herpes Simplex Virus (HSV)	Mikro	EDTA/ Plain gel	Blood CSF/ Vesicle	Blood: 5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	I/Herpes Simplex Virus (HSV) II-DNA (Qualitative) PCR		tube Sterile container	fluid/ BAL/ Tissue biopsy	CSF/Vesicle fluid: 1-3ml							
119	Homocystein, Total (Plasma)	PK	EDTA	Plasma	2ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IEM FORM		IMR-BIO	To be counter signed by specialist
120	Human Immunodeficiency Virus (HIV) Antibody Confirmatory (Western Blot/Immunoblot)	Mikro	EDTA	Plasma	5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HPP	Plasma may be transported and refrigerated at 2-8 °C for up to 4 days or frozen at - 20°C to - 80°C for >4days.
121	Human Immunodeficiency Virus (HIV) Drug Resistance Test (Reverse Transcriptase, Protease and Integrase)	Mikro	EDTA	Blood/ Plasma	5-10ml	Send immediately to the lab	Tuesday & Thursday	40 working days	IMR/Viro/H IV/24		IMR-VIRO	Treatment failure patient, patient's viral load must be >1000, transport in DRY ICE
122	Human Immunodeficiency Virus (HIV) HIV-1 RNA RT PCR for babies (0-18 months)	Mikro	EDTA	Blood/ Plasma	2.5ml	Send immediately to the lab	Tuesday & Thursday	1-5 working days	IMR/Viro/H IV/2		NARL	Mother must be HIV positive. Transport in ice
123	Human Immunodeficiency Virus (HIV) HIV-2 qRT PCR	Mikro	EDTA	Blood/ Plasma	2.5ml	Send immediately to the lab	Tuesday & Thursday	1-5 working days	IMR/Viro/H IV/2		NARL	Transport in ice
124	Human	Mikro	EDTA	Plasma	8ml	Send immediately	Tuesday &	4 weeks	PER-PAT		HSB	Please send

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Immunodeficiency Virus (HIV)-RNA Viral load (Quantitative) PCR					to the lab	Thursday		301			sample only on working days, sample must reach lab 1 hour before office hour ends. To be authorized by specialist.
125	Human Leukocyte Antigen (HLA) Antibody -Panel Reactive Antibody(PRA) -Donor Specific Antibody(DSA)	Mikro	Plain gel tube	Blood	10ml	Send immediately to the lab.	Tuesday & Thursday	20 working days	IMR/AIRC/ TI/RF-4		IMR-AIRC	Appointment is not required. For transplant recipient only (screening test)
126	Human Leukocyte Antigen (HLA) Crossmatch (Complement Dependent Cytotoxicity)	Mikro	Sodium Heparin (donor) Plain gel tube (patient)	Blood	18ml (donor) 5ml (patient)	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-1 @ IMR/AIRC/ TI/RF-5		IMR-AIRC	By appointment only. Please call 03-26162581. For solid organ transplantation
127	Human Leukocyte Antigen (HLA) Crossmatch (Flow Cytometry)	Mikro	Sodium Heparin (donor) Plain gel tube (patient)	Blood	18ml (donor) 5ml (patient)	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-1 @ IMR/AIRC/ TI/RF-5		IMR-AIRC	By appointment only. Please call 03-26162581. For solid organ transplantation

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
128	Human Leukocyte Antigen (HLA) Typing Class I (Loci A, B and C) - Low/Medium Resolution (SSO/SSP-PCR)	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-2		IMR-AIRC	By appointment only. Please call 03-26162581.
129	Human Leukocyte Antigen (HLA) Typing Class I and II (Loci A, B and DR) - Medium/High Resolution (SSO-PCR)	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-2		IMR-AIRC	By appointment only. Please call 03-26162581.
130	Human Leukocyte Antigen (HLA) Typing Class I and II (Loci A, B, C, DR and DQ) - Low Resolution (PCR)	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-2		IMR-AIRC	By appointment only. Please call 03-26162581.
131	Human Leukocyte Antigen (HLA) Typing Class I and II (Loci A, B, DR and DQ) - High Resolution (SSO-PCR) per loci	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-2		IMR-AIRC	By appointment only. Please call 03-26162581.
132	Human Leukocyte Antigen (HLA) Typing Class II (Loci DR, DQ) - Low/Medium Resolution (SSO/SSP-PCR)	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-2		IMR-AIRC	By appointment only. Please call 03-26162581.
133	Human Leukocyte Antigen (HLA)	Mikro	EDTA	Blood	6ml	Send immediately to the lab.	Tuesday & Thursday	10 working days	IMR/AIRC/ TI/RF-3		IMR-AIRC	By appointment

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Typing for Disease Association per loci											only. Please call 03-26162581.
134	Immunofluorescence (IF) & Histopathological Examination (HPE)	Histo/ Sito	Specimen container (50ml)	Tissue biopsy	1:10	Samples are placed into containers with: 1) 10% Neutral Buffered Formalin for HPE 2) Phosphate buffer saline maintained at a temperature of 2°C - 8°C for IF	Monday-Thursday	42 days	PER-PAT 301 (Copy)		HSJ	
135	Immunoglobulin (IgA, IgG, IgM) (Serum)	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		HSB	To be counter signed by specialist
136	Immunohistochemical (IHC) stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 working day	PER-PAT 301 (Copy)		HSB	
137	Immunohistochemical (IHC) stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 week	PER-PAT 301 (Copy)		HKL	
138	Immunohistochemical (IHC) stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 working day	PER-PAT 301 (Copy)		HPP	
139	Immunophenotyping (Leukemia/ Lymphoma/ PNH)	Hema	EDTA	Blood	6ml (3 tubes)	Send immediately to the lab	Tuesday & Thursday	60 working days	PER-PAT 301		HTA	Packed on ice, send within 24 hours
140	Inborn Error Metabolism (IEM) Screening, Blood spot	PK	Whatmann 903 Filter paper	Blood spot	5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IEM Form		IMR-BIO	To be counter signed by specialist
141	Indirect Immunoperoxidase for Rickettsia (IIP)	Mikro	Plain gel tube	Serum	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		HRPB	Transport at 2-8°C
142	Insulin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	PER-PAT 301		HKL	To be counter

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												signed by specialist
143	Insulin-like Growth Factor (IGF-1)	PK	Plain gel tube	Serum	3.5ml	Keep the specimen frozen or within 2-8°C during transportation	Tuesday & Thursday	21 days	PER-PAT 301		HPJ	To be counter signed by specialist
144	Japanese Encephalitis Virus Serology-Antibody Detection	Mikro	Plain gel tube Sterile container	Serum CSF	3ml	Send immediately to the lab	Tuesday & Thursday	7 days	MKAK-BPU-D02-rev_Nov_2015		MKAK	Transport at 2-8°C
145	Japanese Encephalitis Virus-RNA PCR	Mikro	Plain gel tube EDTA Sterile container	Serum Plasma CSF/ Organ biopsy	Serum: 1-3ml Plasma: 1-3ml CSF: 1-3ml Organ biopsy: 1.5cm ²	Send immediately to the lab	Tuesday & Thursday	10 working days	PER-PAT 301		IMR-VIRO	
146	Lead	PK	Heparin	Plasma	4ml	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		IMR-TOF	To be counter signed by specialist
147	Legionella Antigen	Mikro	Sterile container	Urine	NA	Send immediately to the lab	Tuesday & Thursday	1 day	PER-PAT 301		HSB	
148	Leptospira DNA-PCR	Mikro	EDTA Sterile container	Blood Sterile body fluids/ CSF/ BAL/ Tissue biopsy/ Post mortem samples (Before antibiotic)	Blood:2 ml Cecair badan/CS F:3ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IMR/BACT/FORMS/SM IS/01		IMR-BAC	For better sensitivity, blood samplings should be repeated 2 or 3 times, at 3-4 hours interval. Transportation at ambient

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												temperature. If delayed keep at 2-8°C
149	Leptospira Serology- Microagglutination test (MAT)	Mikro	Plain gel tube	Serum	3ml	Send immediately after collection at 2-8°C	Tuesday & Thursday	7 days	MKAK-BPU-U01		MKAK	Requester shall attach the Serology IgM Leptospira result
150	Leukaemia Translocation studies -AML -CML	Hema	EDTA	Blood	4ml	Send immediately to the lab	Tuesday & Thursday	10 working days	Molecular Analysis for Leukaemia Form		IMR	Packed on ice, send within 24 hours
151	Lithium	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	2 working days	TDM Form		HPP	To be counter signed by specialist
152	Middle East Respiratory Syndrome- Coronavirus (MERS-CoV)-RNA PCR	Mikro	Sterile container/ VTM in ice	Lower respiratory sample/ NPA/ Throat swab/ Oral swab	NA	Send immediately to the lab	Tuesday & Thursday	24 hours	PER-PAT 301		HSB	Sample received before 10am, will be processed on the same day.
153	Molecular cytogenetics - Karyolite Bobs	Hema	EDTA	Blood	4ml (2 tubes)	Send immediately to the lab	Tuesday & Thursday	90 working days	PER-PAT 301		HA	*By appointment only * Packed on ice, send within 24 hours
154	Molecular Studies -Jak-2 -BCR/ABL -anti Xa	Hema	EDTA	Blood	4ml (2 tubes)	Send immediately to the lab	Tuesday & Thursday	60 working days	Hospital Ampang Special Hematology Requisition		HA	Sample must arrive at HTA lab within 24 hours

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
									Form			
155	Molecular Studies -Prader-Willi syndrome -Angelman syndrome -Alagile syndrome (JAG 1) -Noonan syndrome -spinal muscular atrophy(SMA) -Fragile X syndrome -Seizure Disorders	Hema	EDTA	Blood	Adult: 8ml Paed: 4ml	Send immediately to the lab	Tuesday & Thursday	90 working days	UMDP special form		IMR-MD	Packed on ice, send within 24 hours
156	Mucopolysaccharides (GAGs/HRE), Urine	PK	Urine container	Early morning urine	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IEM Form		IMR-BIO	To be counter signed by specialist
157	Mumps Virus Isolation	Mikro	VTM	Oral or buccal swab	2.5ml	Send immediately to the lab	Tuesday & Thursday	21 days	MKAK-BPU-U01		MKAK	
158	Mumps Virus Serology-Antibody Detection (IgG/IgM)	Mikro	Plain gel tube	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
159	Mumps Virus-RNA PCR	Mikro	VTM	Oral or buccal swab	2.5ml	Send immediately to the lab	Tuesday & Thursday	3 days	MKAK-BPU-U01		MKAK	
160	<i>Mycobacterium leprae</i> Detection of drug resistant	Mikro	Sterile container with 70% ethanol	Punch biopsy	≥5mm	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		MKAK	
161	<i>Mycobacterium leprae</i> PCR	Mikro	Sterile container	Skin biopsy	≥4x12mm	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		MKAK	
162	<i>Mycobacterium leprae</i> Viability & Antibiotic Sensitivity Test (Ujian Viabiliti & Sensitiviti Antibiotik	Mikro	Sterile Container	Skin Biopsy/ Punch Biopsy	Skin Biopsy:4 x12mm/ Punch Biopsy:5 mm	Sampel diletakkan ke dalam bekas steril tanpa pengawet, dikekalkan pada suhu 2°C - 8°C	Tuesday & Thursday	12-15 months	LIS 102B		MKAK	Transport sample at 2-8°C and to reach laboratory within 24

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Mycobacterium leprae)-Mouse Foot Pad (MFP) Inoculation Method											hours after collection
163	<i>Mycobacterium tuberculosis</i> (MTB) C&S (sampel selain darah)	Mikro	Sterile container/ Universal bottle (Gold Cap)	BAL/ Sputum/ CSF/ Sterile body fluid/ TA/ Pus aspirate/ Tissue/ Urine	3-5ml	Send immediately to the lab	Tuesday & Thursday	8 weeks	TBIS 20C		HSB	Mycobacterium C&S using liquid medium (MGIT) is only done for sterile body fluid sample.
164	<i>Mycobacterium tuberculosis</i> (MTB) GeneXpert	Mikro	Sterile container/ Bijou bottle	BAL/ CSF/ Tissue biopsy/ Lymph node/ Gastric lavage	CSF: 1-3ml	Send immediately to the lab	Tuesday & Thursday	5 days	TBIS 20C		HSAH	Need to consult with Microbiologist before sending. Sample other than listed is not suggested due to low sensitivity.
165	<i>Mycobacterium tuberculosis</i> (MTB)-DNA PCR	Mikro	Sterile container	Sputum/ Pus/ CSF/ Body fluid	CSF:1-2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	For CSF send to lab immediately; for sputum ideally collect 3 consecutive specimens. A single well collected specimen is adequate.
166	<i>Mycobacterium tuberculosis</i> (MTB)-	Mikro	Sterile container	Pus/ Sputum	NA	Send immediately to the lab	Tuesday & Thursday	14 working days	TBIS 20C		MKAK	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Line Probe Assay											
167	Myoglobin & Hemoglobin (Urine)	PK	Urine container	Random urine	15-20ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IEM Form		IMR-BIO	To be counter signed by specialist
168	Nipah Virus Serology-Antibody Detection (IgM/IgG)	Mikro	Plain gel tube EDTA Sterile container	Serum Plasma CSF	1-3ml	Send immediately to the lab	Tuesday & Thursday	14 working days	PER-PAT 301		IMR-VIRO	
169	Oligoclonal Band, CSF	PK	Plain gel tube Bijou bottle	Serum CSF	Serum: 3.5ml CSF: 1ml	CSF must be accompanied by patient's serum. CSF must be frozen immediately after collection. CSF (frozen) and serum (at 2°C-8°C) must reach the lab not more than 7 days after collection date.	Tuesday & Thursday	20 working days	PER PAT 301		HA	To be counter signed by specialist
170	Oligosaccharides (Urine)	PK	Urine container	Early morning urine	5ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	To be counter signed by specialist
171	Organic acid (Urine)	PK	Urine container	Random urine	5ml	Transport FROZEN. Organic acids easily destroyed by heat.	Tuesday & Thursday	5 working days	IEM Form		IMR-BIO	To be counter signed by specialist
172	Orotic acid (Urine)	PK	Urine container	Random urine	5ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IEM Form		IMR-BIO	To be counter signed by specialist
173	Paraneoplastic Neurological	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ Autoimmun		IMR-AIRC	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Syndrome (PNS) Panel Antibodies (Anti-Amphiphysin, Anti-Ma, Anti-Yo, Anti-Ri, Anti-Hu, Anti-CV2)								e/RF			
174	Parathyroid hormone (intact) IPTH	PK	EDTA	Plasma	3ml	To be sent in ice and centrifuge immediately	Tuesday & Thursday	3 working days	PER-PAT 301		HPP	* To be counter signed by specialist *Send in ice *Please provide relevant history and latest calcium and ALP result in the request form.
175	Parvo Virus B19 Serology-Antibody Detection (IgG/IgM)	Mikro	Plain gel tube	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
176	Parvo Virus B19-PCR	Mikro	Plain gel tube Sterile container	Serum CSF	Serum:3 ml, CSF:1ml	Send immediately to the lab	Tuesday & Thursday	5 days	MKAK-BPU-D02-rev_Nov_2015		MKAK	Transport sample at 2-8°C
177	Phospholipase A2 Receptor Antibody (Anti-PLA2R)	Mikro	Plain gel tube	Blood/Serum	5ml	Send immediately to the lab	Tuesday & Thursday	21 working days	IMR/AIRC/Autoimmun e/RF		IMR-AIRC	
178	Pipelicolic Acid, Plasma	PK	Heparin	Plasma	3.5ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	To be counter signed by specialist
179	Platelet Antibody Testing	BB	EDTA	Blood	15ml - 20ml	Send immediately to the lab	Tuesday & Thursday	15 working days	PER-PAT 301		PDN	All request should

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(ITP / Autoimmune Case)						(Before 1pm)					through Specialist / MO On-call for approval (to provide details history regarding the case)
180	Platelet Antibody Testing (ITP / Autoimmune Case)	BB	Plain tube	Blood	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)
181	Platelet Antibody Testing (Other case. Ex: Platelet Refractory)	BB	EDTA	Blood	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)
182	Platelet Antibody Testing (Other case. Ex: Platelet Refractory)	BB	Plain tube	Blood	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												for approval (to provide details history regarding the case)
183	Platelet Antibody Testing (NAIT Case)	BB	EDTA	Blood (Mother's Sample)	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)
184	Platelet Antibody Testing (NAIT Case)	BB	Plain tube	Blood (Mother's Sample)	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)
185	Platelet Antibody Testing (NAIT Case)	BB	EDTA	Blood (Father's Sample)	10ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												history regarding the case)
186	Platelet Antibody Testing (NAIT Case)	BB	EDTA	Blood (Baby's Sample)	1ml	Send immediately to the lab	Tuesday & Thursday (Before 1pm)	15 working days	PER-PAT 301		PDN	All request should through Specialist / MO On-call for approval (to provide details history regarding the case)
187	<i>Pneumocystis jiroveci</i> Antigen Detection (IF)	Mikro	Sterile container	Induced Sputum/ BAL	3ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
188	Polio Virus and Non-Polio Virus -Acute Flaccid Paralysis (AFP) Isolation	Mikro	Sterile container/ VTM	Stool (prefered)*(to collect within 14 days of onset, 2 adequate sample to collect in 24-48hours apart),Rectal swab,Throat swab,CSF	Stool: >5gm (thumb size) CSF: 0.5ml	Send immediately to the lab	Tuesday & Thursday	28 working days	AFP Case Investigation Form		IMR-VIRO	
189	Porphyria Profile, Urine	PK	Urine container	Random urine	5ml	Send immediately to the lab	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	* To be counter signed by specialist * Protect from light. Porphyrin

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
												easily destroyed by light.
190	Primary Immunodeficiency (PID)-Bruton Tyrosine Kinase (BTK) Protein Detection	Mikro	EDTA	Blood	2ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ PID/RF		IMR-AIRC	By appointment only
191	Primary Immunodeficiency (PID)- Dihydrorhodamine Assay (DHR)	Mikro	Lithium heparin	Blood	2ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/AIRC/ PID/RF		IMR-AIRC	By appointment and consultation only
192	Primary Immunodeficiency (PID)-Lymphocyte Proliferation Assay	Mikro	Sodium heparin	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	30 working days	IMR/AIRC/ PID/RF		IMR-AIRC	By appointment and consultation only
193	Primary Immunodeficiency (PID)-Lymphocyte Subset Enumeration (TBNK)	Mikro	EDTA	Blood	2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	IMR/AIRC/ PID/RF		IMR-AIRC	By appointment only
194	Primary Immunodeficiency (PID)-Panel Immunoglobulin & Complement Quantitation (IgA,IgG,IgM,C3&C4)	Mikro	Plain gel tube	Serum	5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	IMR/AIRC/ PID/RF		IMR-AIRC	Upon request only
195	Protein electrophoresis	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	10 working days	PER-PAT 301		HPP	Requested by specialist only
196	Pterins, CSF	PK	Sterile	CSF	1ml	Cover from light,	Tuesday &	15 working	IEM Form		IMR-BIO	*To be

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
			container with preservative (DTE & EDTA)			Transport FROZEN. (Pterins easily destroyed by heat and light)	Thursday	days				counter signed by specialist *Avoid sunlight (wrap with aluminium foil) *Send with dry ice (frozen)
197	Pterins, Urine	PK	Urine container	Random urine	5ml	Cover from light, Transport FROZEN. (Pterins easily destroyed by heat and light)	Tuesday & Thursday	15 working days	IEM Form		IMR-BIO	*To be counter signed by specialist *Avoid sunlight (wrap with aluminium foil) *Send with dry ice (frozen)
198	Purine & Pyrimidine	PK	Urine container	Random urine	2-5ml	Send immediately to the lab	Tuesday & Thursday	2 months	PER-PAT 301		HTA	To be counter signed by specialist
199	Rabies Virus-DNA/RNA PCR	Mikro	After consultation only	After consultation only	After consultation only	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-VIRO	After consultation only
200	Renin	PK	EDTA	Plasma	2ml	Send immediately to the lab	Tuesday & Thursday	21 days	PER-PAT 301		HPJ	To be counter signed by specialist
201	Rubella Serology-Antibody Detection	Mikro	Plain gel tube	Serum	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	(IgG/IgM)											
202	Skin Antibodies Panel (Anti-BP 180, Anti BP-230, Anti-Desmoglein 1 & Anti-Desmoglein 3)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
203	Slit Skin Smear - Slide for QC	Mikro	Slide	Smear	NA	Send immediately to the lab	Tuesday & Thursday	NA	LIS 102A LIS 102B		MKAK	
204	Special stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 working day	PER-PAT 301 (Copy)		HSB	
205	Special stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	2 weeks	PER-PAT 301 (Copy)		HKL	
206	Special stain	Histo/ Sito	NA	Unstained slide	NA	Send in room temperature	Monday-Thursday	1 working day	PER-PAT 301 (Copy)		HPP	
207	Specific Liver Antibodies Panel (Anti-AMA-M2, M2-3E/BPO, Sp100, PML, gp210, LKM1, LC-1, SLA/LP, Ro-52)	Mikro	Plain gel tube	Blood/ Serum	5ml	Send immediately to the lab	Tuesday & Thursday	14 working days	IMR/AIRC/ Autoimmun e/RF		IMR-AIRC	
208	S-Sulphocysteine, Urine	PK	Urine container	Random urine	2-5ml	Send immediately to the lab	Tuesday & Thursday	15 working days	PER-PAT 301		IMR-BIO	To be counter signed by specialist
209	<i>Streptococcus pneumoniae</i> Antigen	Mikro	Sterile container	Urine	NA	Send immediately to the lab	Tuesday & Thursday	1 working day	PER-PAT 301		HSB	
210	Surveillance	Mikro	Plain gel tube NA Slant	Serum Isolate	Serum: 5ml	Send immediately to the lab	Tuesday & Thursday	NA	PER-PAT 301		IMR MKAI MKAK	
211	Surveillance for Acute Respiratory Illness - COVID-19 (SARS-CoV-2) PCR	Mikro	VTM/ Sterile container	NPS/ OPS/ TA	NA	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSB	Send in ice
212	Tacrolimus	PK	EDTA	Plasma	2ml	Send immediately	Tuesday &	5 working	TDM Form		HPP	To be

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
						to the lab	Thursday	days				counter signed by specialist
213	Taeniasis/Cysticercosis-Serology	Mikro	Plain gel tube EDTA	Serum Blood	2ml	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-PARA	
214	Thrombophilia Profile -Lupus anticoagulant (LA) -Antiphospholipid Ab -Anticardiolipin Ab -Protein C, S -Factor V Leiden Coagulation disorder -VWD profile	Hema	3.2% Trisodium Citrate (12-15ml)	Blood	15ml (6 tubes)	Send immediately to the lab (Blood should be processed within 4 hours from the time of collection)	Tuesday & Thursday	30 working days	Hematology/ Serology Request Form National Blood Centre		PDN	Thrombophilia Profile need to be discussed with HTF Hematology Specialist
215	Thyroglobulin	PK	Plain gel tube	Serum	2-3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HPP	To be counter signed by specialist
216	TORCH Serology-Antibody Detection (Toxoplasma, Rubella, CMV)	Mikro	Plain gel tube	Blood	3-5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HSB	
217	Toxicology Test, Blood	PK	Universal container with sodium citrate/oxalate (0.5%)	Blood	4ml	Send immediately to the lab	Tuesday & Thursday	2 months	Kimia 15-Pin.1/2004		JKM, Pulau Pinang	To be counter signed by specialist
218	Toxicology Test, Urine	PK	Sodium fluoride tube	Random urine	2ml	Send immediately to the lab	Tuesday & Thursday	2 months	Kimia 15-Pin.1/2004		JKM, Pulau Pinang	To be counter signed by specialist
219	Toxoplasma	Mikro	Plain gel	Serum	3-5ml	Send immediately	Tuesday &	7 working	PER-PAT		HSB	

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
	Serology-Antibody Detection (IgG/IgM)		tube			to the lab	Thursday	days	301			
220	Transferin	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	BORANG MULTIPLE MYELOMA & SPECIFIC PROTEINS		HA	To be counter signed by specialist
221	Vancomycin resistant Enterococci (VRE) Isolate Confirmation & AST Verification	Mikro	Media that support growth	Pure bacterial isolate	NA	Send immediately to the lab	Tuesday & Thursday	7 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	Send pure isolates with clinical history
222	Varicella Zoster Virus Serology-Antibody Detection (IgG/IgM)	Mikro	Plain gel tube	Blood	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
223	Varicella Zoster Virus-DNA PCR (Qualitative/Quantitative)	Mikro	Plain gel tube Sterile container	Blood BAL	5ml	Send immediately to the lab	Tuesday & Thursday	2 days	PER-PAT 301		HSgB	
224	Verification of Antibiotic Resistance other than Carbapenem Resistance Enterobacteriaceae	Mikro	Media that support growth	Pure bacterial culture	NA	Send immediately to the lab	Tuesday & Thursday	7 working days	IMR/BACT/ FORMS/SM IS/01		IMR-BAC	Preliminary tests must be performed first and results sent together with pure isolate and clinical history. Transport in ambient temperature.
225	Vitamin B12	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	1 week	PER-PAT 301		HSB	To be counter signed by specialist

No	TEST	UNIT	CONTAINER	SPECIMEN TYPE	VOLUME	DELIVERY AND STORAGE	SCHEDULE	TAT (REFERRAL LAB)	FORM	PRICE	REFERRAL LAB	NOTES
226	Vitamin D	PK	Plain gel tube	Serum	3.5ml	Send immediately to the lab	Tuesday & Thursday	7 working days	PER-PAT 301		HPJ	To be counter signed by specialist
227	Zika Virus-DNA/RNA PCR	Mikro	After consultation only	After consultation only	After consultation only	Send immediately to the lab	Tuesday & Thursday	5 working days	PER-PAT 301		IMR-VIRO	After consultation only

LAMPIRAN/APPENDICES

APPENDIX 1

SENARAI UJIAN DAN NILAI KRITIKAL

PATOLOGI KIMIA		
Ujian/Analyte	Lower limit	Upper limit
Ammonia		>100 µmol/l (paed)
Sodium	< 125 mmol/l	>155 mmol/l
Potassium	< 2.5 mmol/l	>6.0 mmol/l
Total Calcium	< 1.5 mmol/l	>3.0 mmol/l
Bilirubin (pediatric)	> 300 umol/l	

HEMATOLOGI		
Ujian/Analyte	Lower limit	Upper limit
FBC		
a. WBC		
Adult	2000 µL	50000 µL
Paed	2000 µL	30000 µL
Neonate	2000 µL	30000 µL
b. Haemoglobin		
Adult	6 g/dl	19 g/dl
Paed	7 g/dl	20 g/dl
Neonate	8 g/dl	22 g/dl
c. Hematocrit		
Adult	20%	60%
Paed	20%	40%
Neonate	25%	70%
c. Platelet		
Adult	20000 µL	1000000 µL
Paed	50000 µL	1000000 µL
Neonate	50000 µL	1000000 µL
PT/APTT/INR		
a. INR (pesakit tanpa antikoagulan)	-	> 2.5
b. INR (pesakit dengan antikoagulan ie warfarin)	-	> 5
c. APTT	-	> 80 sec

MIKROBIOLOGI	
Test	Clinical Finding
Kultur dan Sensitiviti	Darah dan cecair badan Positive (Pewarnaan gram dan kultur) <i>Salmonella typhi</i> / <i>Vibrio cholera</i> / <i>Shigella</i> spp CSF- Pewarnaan Gram Alert organism isolate (ESBL/MRSA/VRE/VRSA/MRO/CRE)
TB / BFMP/Dengue/Leptospira	Positive
Pernasal	<i>Bordetella pertussis</i>
Throat swab	<i>Corynebacterium diptheriae</i>

<i>HISTOSITOPATOLOGI</i>	
Test	Clinical Finding
Unexpected or Discrepant Findings	Unexpected malignancy Wrong organ removed
Report of Infection	Bacteria in heart valves or bone marrow Organism in an immune compromised patient such as AFB, fungi, viral or protozoa Organism in Cerebrospinal Fluid (CSF) Unusual organisms or organism in unusual sites
Report on Critically ill Patient Requiring Immediate Therapy	Crescents in greater than 50% of glomeruli in renal biopsy specimen Transplant rejections
Cases that have immediate clinical consequences	Fat in an endometrial curettage Mesothelial cell in a heart biopsy Fat in snare colon biopsy specimen
High Grade Lesion in Pap Smear	HGSIL HGSIL with Suspicious of Invasion Squamous Cell Carcinoma Atypical Glandular, Favours Neoplastic Adenocarcinoma In Situ (AIS) Adenocarcinoma Other type of malignancy

GUIDELINE ON URGENT TESTS REQUEST

Definition

- **Urgent test:** Request of test that need to be released within stipulated time as it is critical to patient care
- **Laboratory Turn Around Time (LTAT):** Time taken from specimen received at the lab counter to release of lab result.

Scope

This guideline is applicable for tests that are provided in 24 hours laboratory (Chemical Pathology and Haematology Unit). Please follow respective unit guideline for urgent request for other type of tests.

Service Provision

- Specimen reception counter is open for the reception of samples at any times (24 hours/day). The listed below are those provided on an Urgent and Emergency basis.
- Samples requiring these tests should be clearly **labeled (preferably in capital letter; use red ink pen) or red colour stamped; as “SEGERA/URGENT” etc** preferably at the **uppermost of the request form.**
- These samples will usually be analysed and reported in 60 minutes (LTAT) from receipt in the laboratory.

Laboratory	Test
Hematologi	Full blood count (FBC) PT/APTT
Patologi Kimia	Blood gases Blood urea & electrolytes (BUSE) Renal profile (Including Serum creatinine) Serum Bilirubin (peadiatrics) Cardiac markers (Cardiac enzymes & Troponin) Serum Amylase (TRO Acute Pancreatitis) β HCG (TRO Ectopic Pregnancy) Urine Paraquat
Mikrobiologi	CSF Gram Stain Dengue Serology Leptospira Serology

- The results of these tests will be informed to the requester if it is in the **‘Critical Value’ range.**
- For tests other than listed above, requester needs to call **Pathologist On Call** if tests needed to be done urgently.
- For request of urgent test, please separate the sample and form from the non-urgent request such as liver function test, fasting serum lipid etc. These requests shall be transported manually to specimen reception counter.
 - Should the urgent and non-urgent request are send together in a same tube and form, or transported through “pneumatic tube system”, it will be managed as non-urgent regardless of the ‘Urgent’ label (due to difficulty in sorting the test).

- Please ensure that the urgent request is really for urgent test as in the definition above and not because of other reasons such as for immediate patient discharge from wards, anaesthetist assessment round for elective surgery etc because it will affect the LTAT of the truly urgent test which in turn will compromise patient care.

APPENDIX 3**ARAHAN PENGAMBILAN SPESIMEN KEPADA PESAKIT****SPESIMEN AIR KENCING (MSU)**

1. SPESIMEN YANG TERBAIK ADALAH SPESIMEN DI AWAL PAGI
2. BASUH BAHAGIAN SULIT DENGAN SABUN, KEMUDIAN LAPKAN DENGAN TISU ATAU KAIN BERSIH SEHINGGA KERING.
3. KUMPULKAN AIR KENCING DI PERTENGAHAN SEMASA MEMBUANG AIR KECIL KE DALAM BEKAS YANG TELAH DIBERI (MID STREAM URINE).
4. TUTUP BEKAS DENGAN RAPAT DAN CATATKAN MASA AIR KENCING DIKUMPUL.
5. MASUKKAN KE DALAM BEKAS PLASTIK.
6. HANTAR SPESIMEN KE MAKMAL DALAM MASA 1 JAM.
7. JIKA TEMPOH DIJANGKAKAN > 1 JAM, LETAKKAN SPESIMEN KE DALAM BEKAS MENGANDUNGI AIS.

KAHAK UNTUK C&S

1. SPESIMEN YANG TERBAIK ADALAH YANG DIAMBIL DI AWAL PAGI.
2. BATUK DENGAN KUAT UNTUK DAPATKAN KAHAK (BUKAN AIR LIUR)
3. MASUKKAN KE DALAM BEKAS DAN TUTUP DENGAN RAPAT.

**JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS**

**ARAHAN PUNGUTAN SAMPEL AIR
KENCING 24 JAM**

Pungutan dan analisa air kencing 24 jam telah diminta oleh doktor. Sila patuhi arahan seperti berikut.

1. Semasa bangun pada waktu pagi, sila kencing ke dalam tandas untuk mengosongkan pundi kencing. Serentak dengan itu, catat masa tersebut pada bekas yang telah diberikan.
2. Dalam tempoh 24 jam, pungut semua air kencing ke dalam bekas tersebut. Masukkan juga titisan air kencing ke dalam bekas tersebut dan jangan dibuang.
3. Kutipan berakhir pada keesokan pagi, tepat pada waktu yang sama seperti yang telah dicatatkan pada bekas pada hari sebelumnya.
4. Bekas air kencing hendaklah diletakkan dalam keadaan menegak dan simpan di tempat sejuk atau dalam peti sejuk (4°C) ketika tempoh pemungutan.
5. Hantar bekas dengan air kencing yang telah siap dipungut ke Jabatan Patologi, Hospital Tuanku Fauziah secepat mungkin.
6. Bekas air kencing yang dibekalkan mungkin mengandungi sedikit bahan kimia untuk memastikan air kencing dalam keadaan yang sesuai untuk dianalisa.
7. Elakkan daripada tumpahan bagi memastikan keputusan ujian yang tepat dan untuk keselamatan tuan/puan kerana bahan kimia tersebut berbahaya sekiranya terkena pada badan.
8. Sekiranya arahan ini tidak dipatuhi sebaiknya, keputusan ujian air kencing ini berkemungkinan tidak boleh digunakan dan anda terpaksa memulakan pemungutan air kencing ini sekali lagi.

**COLLECTION OF 24 HOURS URINE
SAMPLE**

A 24-hour urine collection and analysis has been asked by the doctor. Please follow these instructions strictly.

1. Upon getting up from bed in the morning, do urinate in the toilet and completely empty your bladder. Immediately look at your watch and record this time on the provided container.
2. You should then start collecting any urine following this time for the next 24 hours in the provided urine container. Do not discard any urine drops.
3. The collection ends the next morning. The last urine passed into the container should be around the same time as recorded on the container (ie the day before)
4. You should keep the urine container in the upright position and it is preferable to put it in a cold place or to refrigerate it at 4°C during the collection period.
5. Send the urine container as soon as possible to Pathology Department, Hospital Tuanku Fauziah.
6. The provided container may contain small volumes of chemical solutions which is essential to keep the urine making it suitable for the test.
7. Please ensure the urine volume is not spill as this may affect the accuracy of the test result and also for your own safety. The chemical solution is harmful if it contacts your body.
8. If any of these instructions are not followed strictly, the result of the requested test will not be reliable and you may have to start from the beginning again.

**JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS**

**ARAHAN PUNGUTAN SAMPEL AIR
KENCING 24 JAM – UJIAN URINE
CATECHOLAMINES**

Pungutan dan analisa air kencing 24 jam telah diminta oleh doktor untuk analisa makmal. Untuk tujuan ini, beberapa jenis makanan tidak boleh dimakan untuk tempoh sekurang-kurangnya 3 hari sebelum memulakan pungutan air kencing (Sila lihat senarai makanan yang dinyatakan dibawah)

Sila baca dengan teliti dan patuhi arahan pungutan sampel air kencing 24 jam seperti dalam lampiran yang dikepikan.

PERHATIAN:

Bekas pungutan air kencing ini mengandungi sedikit Asid Hidroklorik. Ianya mungkin merbahaya sekiranya terkena kulit.

Jangan kencing terus ke dalam bekas ini dan berhati-hati ketika memasukkan air kencing ke dalamnya untuk mengelakkan terkena percikan asid tersebut.

Sekiranya terkena asid, pastikan dibasuh dengan air yang banyak. Jika terkena mata atau kulit terbakar, dapatkan rawatan doktor dengan segera.

Makanan berikut tidak boleh dimakan dalam tempoh 3 hari sebelum pungutan air kencing dilakukan:

- Coklat
- Kopi
- Pisang
- Buah-buahan sitrus (limau)
- Makanan mengandungi vanilla
- Ubat-ubatan, sila rujuk kepada doktor sekiranya pengambilan ubat perlu dihentikan selama 3 hari

**COLLECTION OF 24 HOURS URINE
SAMPLE - URINE CATECHOLAMINES
TEST**

A 24-hour urine collection and analysis has been asked by the doctor for laboratory testing. To collect this correctly, certain foods shall not be eaten for at least 3 days before you begin collecting the urine, as listed below.

Please read and carefully follow the directions for collecting this 24-hour urine sample, according to the sheet attached.

CAUTION:

Please note that the collection container contains a small volume of Hydrochloric Acid. This may be harmful to your skin.

Do not pass the urine directly into the container and be careful when pouring the urine into it, so it will not splash on you.

In case the acid gets on you, wash with large amount of water. If it gets into your eyes or continues to burn the skin, get immediate medical attention.

Do not eat these foods for 3 days before urine collection:

- Chocolate
- Coffee
- Bananas
- Any citrus fruits
- Any food with vanilla
- Medication, ask your doctor if you should stop your medicine for three days

**JABATAN PATOLOGI
HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS**

**ARAHAN PERSEDIAAN BAGI UJIAN
GLUCOSE TOLERANCE (GTT)**

Sila patuhi arahan berikut untuk memastikan keputusan ujian yang tepat (ujian ini akan mengambil masa lebih daripada 2 jam).

SEBELUM UJIAN:

- Anda tidak boleh makan, mengunyah atau minum (kecuali air kosong) untuk sekurang-kurangnya 10 jam dan tidak melebihi 16 jam sebelum sampel darah diambil untuk diuji

APABILA TIBA DI HOSPITAL:

- Adalah penting untuk anda sampai pada masa yang tepat seperti dinyatakan pada kad temujanji
- Anda akan diberikan minuman glukosa terlebih dahulu sebelum darah anda diambil selepas sela masa tertentu

SEMASA UJIAN:

- Anda tidak dibenarkan meninggalkan kawasan makmal semasa ujian
- Anda juga dilarang merokok, makan dan minum (kecuali sedikit air kosong) semasa ujian berlangsung

**PREPARATION FOR GLUCOSE
TOLERANCE TEST (GTT)**

For accurate test results, please follow these instructions carefully (this test will take more than 2 hours).

BEFORE THE TEST:

- Have nothing to eat, chew or drink for at least 10 hours (except plain water) and shall be no more than 16 hours before the blood sample is drawn

WHEN YOU GET TO THE HOSPITAL:

- It is important that you arrive on time for your appointment.
- You will be given a glucose drink prior to sample taking.
- The blood samples will then be drawn after a certain period.

DURING THE TEST:

- Please do not leave the laboratory area during the test
- You are not allowed to smoke, eat or drink (except small amounts of plain water) during the test.

CARA MELABEL SAMPEL IBU DAN ANAK BAGI UJIAN GXM

Sampel Anak:

- i. Labelkan nama penuh anak (sekiranya ada) atau baby of (diikuti nama penuh ibu) sekiranya anak belum ada nama.
- ii. Labelkan dalam kurungan seperti berikut: (Baby's sample)
- iii. No KP anak (sekiranya ada) atau No KP ibu sekiranya anak belum ada No KP.
- iv. Nama ujian.
- v. Tarikh dan masa pengambilan sampel.
- vi. Tandatangan ringkas (*initial*) phlebotomist.

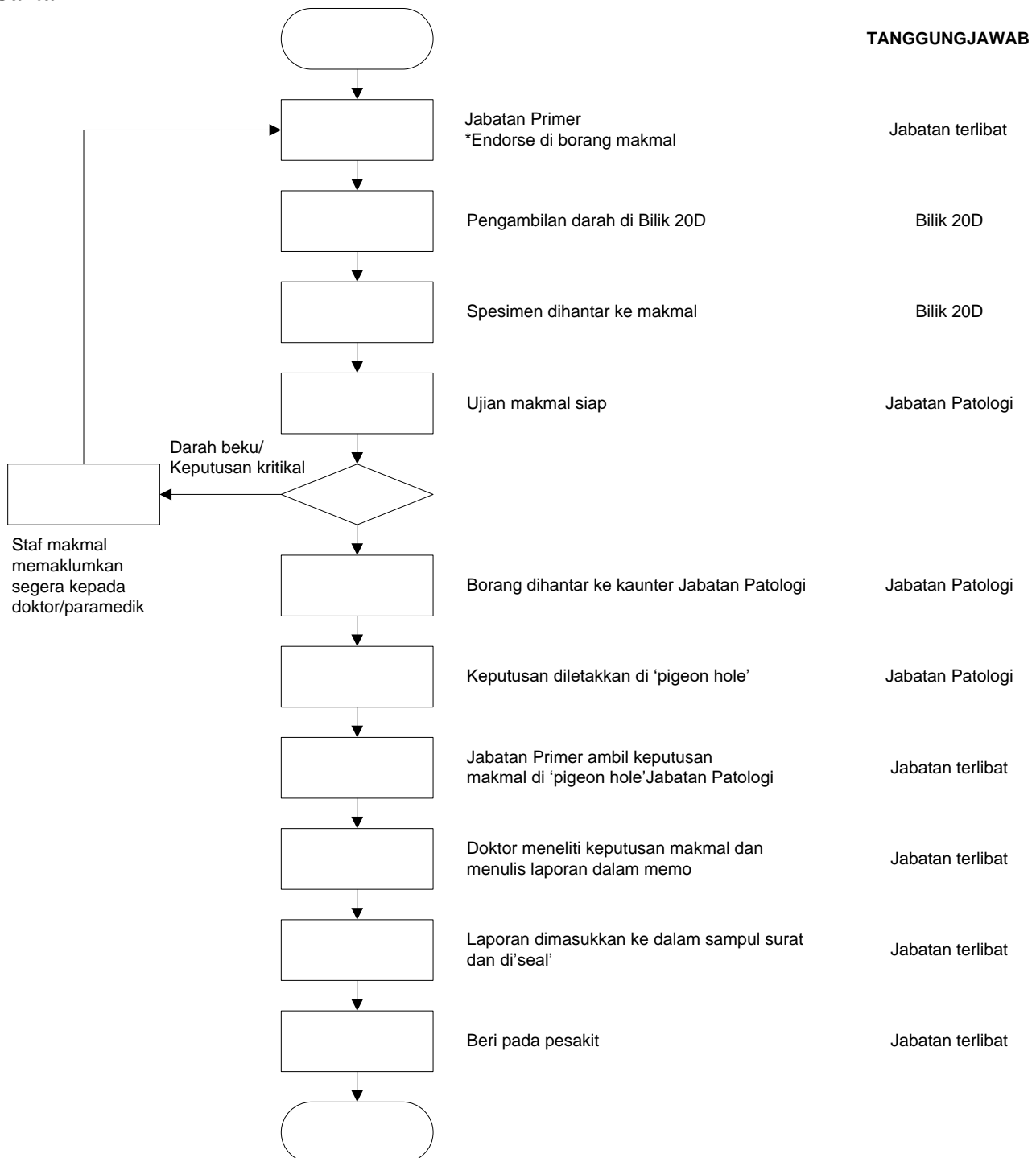
Sampel Ibu:

- i. Labelkan nama penuh anak (sekiranya ada) atau baby of (diikuti nama penuh ibu) sekiranya anak belum ada nama.
- ii. Labelkan dalam kurungan seperti berikut: (Mother's sample)
- iii. No KP anak (sekiranya ada) atau No KP ibu sekiranya anak belum ada No KP.
- iv. Nama ujian.
- v. Tarikh dan masa pengambilan sampel.
- vi. Tandatangan ringkas (*initial*) phlebotomist.

Label Nama dan No KP perlu lah sama pada sampel anak, sampel ibu dan juga borang Permohonan Transfusi Darah Perkhidmatan Transfusi Perubatan, PER-SS-BT 105 (Pind.1/2016) (Pind.HTF 1/2017).

GARIS PANDUAN PENGENDALIAN PROSES PENGAMBILAN DARAH PESAKIT DARI HOSPITAL RUJUKAN (LUAR)

Carta Alir



Catatan

Garis panduan ini disediakan bagi memantapkan proses pengurusan kes-kes yang dirujuk ke Hospital Rujukan (Luar) dan diarahkan untuk mengambil ujian darah di hospital ini sebelum membuat lawatan susulan: -

1. Jabatan yang terlibat (Primary team) yang merujuk pesakit perlu memaklumkan pesakit tentang perkara-perkara berikut:
 - i. Pesakit perlu datang ke klinik/Jabatan Primer yang terlibat dahulu untuk 'endorse' borang makmal oleh doktor di Jabatan Primer.
 - ii. Penerangan jelas perlu diberikan kepada pesakit mengenai: -
 - a) Jenis darah yang diambil
 - b) Jangkamasa keputusan makmal siap
 - c) Datang lebih awal dari tarikh temujanji pada hari bekerja sahaja dan elakkan dari hari minggu atau hari cuti umum.
 - iii. Staf di Jabatan Primer perlu mengambil keputusan dari makmal.
 - iv. Keputusan makmal perlu ditulis dalam laporan memo oleh doktor dan dimasukkan ke dalam sampul surat yang di'seal'kan sebelum diberikan kepada pesakit untuk dibawa semasa rawatan susulan di hospital rujukan.
2. Sekiranya keputusan/nilai darah kritikal (critical value) atau darah beku: -
 - Staf makmal akan menghubungi terus Pegawai Perubatan/Paramedik Jabatan terlibat untuk tindakan selanjutnya.

KRITERIA PENOLAKAN SPESIMEN DI MAKMAL HISTOPATOLOGI DAN SITOLOGI

1. Penghantaran Borang Yang Salah/Tidak Mencukupi/Tidak Jelas/Tiada Borang/Tatacara yang Salah
 - a. Spesimen mestilah disertakan dengan 1 helaian borang permintaan PER PAT 301 (Borang PS1/98 (Pindaan 2007) untuk Pap smear).
 - b. Borang ujian Urgent/STAT digunamakan dengan ujian lain.
2. Borang Tidak Lengkap/Tidak Jelas (dengan sekurang-kurangnya perkara dibawah wajib ada)
 - a. Maklumat pesakit
 - i. Nama penuh pesakit
 - ii. Nombor identiti (nombor kad pengenalan, passport atau setaraf dengannya. Jika tiada nyatakan tiada/non available (NA))
 - iii. Nombor RN Hospital (jika Pesakit Dalam. Nyatakan tiada/non available (NA) jika pesakit luar atau pesakit dari jabatan kecemasan. Salah satu, sama ada nombor kad pengenalan, nombor passport, nombor RN atau apa sahaja nombor pengenalan yang setaraf dengannya mesti ada. Jika tiada nyatakan sebab kenapa tiada nombor pengenalan diri pada ruangan 'History'.
 - iv. Jantina
 - v. Umur atau apa-apa secara tidak langsung menunjukkan umur pesakit di dalam borang.
 - vi. Nama Wad/Klinik
 - b. Diagnosis dan sejarah pesakit di ruangan 'Diagnosis' dan di ruangan 'History'.
 - c. Permintaan ujian di ruangan 'Jenis Ujian'.
 - d. Butiran tarikh dan masa pengambilan spesimen diambil di ruangan 'Tarikh' dan 'Masa'.
 - e. Maklumat pemohon
 - i. Nama pegawai perubatan dinyatakan dengan jelas
 - ii. Tandatangan dan cop rasmi pegawai perubatan yang memohon
3. Label Pada Botol/Tiub/Slide Spesimen yang Tidak Lengkap/Tidak Sama Pada Borang (Sekurang-kurangnya perkara dibawah mesti ada)
 - a. Nama pesakit seperti pada borang permohonan
 - b. Nombor RN/Nombor identiti pesakit seperti pada borang permohonan. Jika tiada, nyatakan tiada/non-available (NA).
 - c. Jenis Ujian seperti pada borang permohonan. Maklumat ini dibolehkan berbeza dengan yang tertulis pada borang asalkan ia bermaksud ujian HPE dan/atau tidak bercanggah dengan maksud/perkara/benda yang tertulis pada borang permohonan.
4. Penggunaan Botol/Tiub/Slide/Fiksatif yang Salah
5. Botol/Tiub/Slide Spesimen yang Bocor atau Tertumpah atau Pecah
6. Tiada spesimen

*Senarai ini adalah tambahan kepada senarai kriteria penolakan spesimen yang dinyatakan didalam TPM-HTF/PL/09 (Prosedur Pengendalian Spesimen) dan 'Laboratory Handbook'.

APPENDIX 7**KRITERIA PENOLAKAN UNIT MIKROBIOLOGI**

Comment
Test rejected: No request form received
Test rejected: No patient's name on form/sample
Test rejected: No IC No/RN/AE No on form/sample
Test rejected: No date and time written
Test rejected: No diagnosis (clinical indication) on form
Test rejected: No clinical summary, surgical finding or family history on form
Test rejected: No requester's (Dr) name/stamp/signature
Test rejected: Wrong patient information Details on form are not same as label on sample
Test rejected: Wrong order
Test rejected: Hemolysed sample Lipaemic sample Icteric sample Leaking sample
Test rejected: Wrong container
Test rejected: Broken container
Test rejected: Test requested by other than Medical Officer (except for routine test from KK)
Test rejected: Wrong sample. Unsuitable for analysis
Test rejected: Insufficient sample
Test rejected: Salivary specimen. UNSUITABLE for direct smear. Please repeat with well-collected sputum. Early morning specimen most recommended.
Test rejected: Macroscopic evaluation of this specimen indicates that the collection was of POOR quality. Culture of this specimen will not be performed. Please send another well-collected sample if clinically indicated.
Test rejected: Unknown status of vaccination for Hepatitis B Virus (HBV). Please provide date of completed vaccination.
Test rejected: No specimen received
Test rejected: Sample not labeled
Test rejected: Unknown status of ANA screening. Please provide result of ANA(IF) done in HPP before requesting ENA test.
Test rejected: Improper smear (poo/bad/wet smear)
Test rejected: Test not offered
Test rejected: Broken slide
Test rejected: For Catheter Related Blood Stream Infection (CRBSI) or line related infection, these samples MUST be sent to support diagnosis: ➤ At least one set of CENTRAL blood culture and one set of PERIPHERAL blood culture, where these MUST be collected at same time and both MUST be included during transport to lab. OR ➤ TIP of catheter MUST be sent with one set of PERIPHERAL blood culture.

Test rejected:	No significant clinical indication
Test rejected:	Sample sent at inappropriate time interval. Kindly refer to Latest Tuberculosis CPG.
Test rejected:	No sample received. Please send new sample separately for this test due to different test method.

APPENDIX 8**KRITERIA PENOLAKAN UNIT PATOLOGI KIMIA**

KRITERIA	TINDAKAN	
	TOLAK	TERIMA DENGAN PEMBETULAN
Tiada borang permohonan atau menggunakan borang yang salah.		√
Borang permohonan diisi tidak lengkap.		√
Butiran di borang tidak sama dengan label bekas/tiub.	√	
Spesimen tidak sesuai untuk dianalisa/ beku/lisis/ tumpah/tidak menepati isipadu ditetapkan/tiada spesimen	√	
Bekas yang digunakan salah	√	
Tiada tandatangan dan cop pemohon/pakar bagi ujian khas		√
Tiada diagnosis/ Tiada indikasi ujian (sebab-sebab ujian dipohon) bagi ujian-ujian khas hormone/ujian outsource		√
Tiada ringkasan klinikal (kecuali ujian rutin)		√
Tiada nama/cop nama/tandatangan/ nama pegawai perubatan tidak jelas		√
Ujian tidak ditawarkan oleh Unit Patologi Kimia, HTF	√	

- Jenis permohonan yang ditolak dan dibenarkan pembetulan dilakukan:
 - Ujian biokimia; spesimen disimpan untuk tempoh 4 jam bagi ujian rutin sahaja. Bagi ujian yang memerlukan tandatangan PAKAR/ ujian outsource, specimen hanya disimpan untuk tempoh 48jam sahaja.
 - Ujian blood gas/urinalysis ; ujian dianalisa dahulu tetapi keputusan tidak dikeluarkan sehingga pembetulan dibuat.

APPENDIX 9**KRITERIA PENOLAKAN UNIT TRANSFUSI**

	KRITERIA PENOLAKAN
A.	BORANG PERMOHONAN
1	Tiada / Salah borang
2	Tiada nama pesakit
3	Nama / No.KP / No. Passport / No.AE tidak lengkap
4	Tiada tandatangan doktor pada borang
5	Tiada cop doktor pada borang
6	Borang tidak diisi dalam 2 salinan
7	Borang tercemar dengan darah
8	Tiada initial & cop pada ruang 'Disaksi/disemak oleh' di Borang GSH/GXM (Hanya TLN/MO/Pakar sahaja dibenarkan)
B.	SPESIMEN
1	Tiada / Salah tiub
2	Tiada nama ujian
3	Nama / No.KP / No. Passport / No.AE tidak lengkap
4	Tiada initial doktor pada tiub (bagi sampel GSH& GXM)
5	Tiub tercemar dengan darah
6	Isipadu darah tidak mencukupi
7	Hemolisis
C.	LAIN-LAIN
1	Nama / No.KP / No. Passport / No.AE pada borang tidak sepadan dengan tiub spesimen
2	Nama / No.KP / No. Passport tidak sama dengan rekod terdahulu
3	Ujian yang dipohon tidak dilakukan di makmal
4	Ujian GSH yang berulang dalam tempoh 72 jam
5	Lain-lain (Nyatakan):

APPENDIX 10**KRITERIA PENOLAKAN UNIT HEMATOLOGI**

KRITERIA	TINDAKAN	
	TOLAK	TOLAK DAN DIBENARKAN PEMBETULAN
Tiada borang permohonan atau borang yang salah		√
Tiada nama pesakit di borang dan spesimen	√	
Tiada nama pesakit di bekas spesimen	√	
Tiada nama pesakit di borang permohonan		√
Tiada label di bekas spesimen	√	
Tiada sampel	√	
Tiada no KP/PN/AE no/ My Kid/Mother IC (Borang dan spesimen)	√	
Tiada no KP/PN/AE no/ My Kid/Mother IC di spesimen	√	
Tiada no KP/PN/AE no/ My Kid/Mother IC di borang		√
Tiada diagnosis/ Tiada indikasi ujian (sebab ujian dipohon)		√
Tiada ringkasan klinikal (kecuali ujian rutin)		√
Tiada nama/cop nama/tandatangan/ nama pegawai perubatan/ pakar perubatan tidak jelas		√
Butiran di borang tidak sama dengan di label spesimen	√	
Spesimen beku/lisis/tumpah/icteric tidak menepati isipadu ditetapkan/tiada spesimen	√	
Bekas yang digunakan salah	√	
Tiada masa pengambilan spesimen		√
Ujian Makmal Rujukan yang dihantar selepas waktu pejabat (ujian IPT dan cytogenetic study)	√	

Redundant (Hb Analysis dan DNA Analysis)	√	
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- Bagi permohonan ujian yang ditolak dan dibenarkan pembetulan dilakukan:
- Ujian Hematologi; spesimen disimpan untuk tempoh 4 jam sahaja kecuali ujian yang akan dihantar ke makmal rujukan
- Borang permohonan bagi ujian yang perlu dihantar ke makmal rujukan pada hari yang sama/segera perlu dilengkapi dan dihantar ke Makmal Hematologi pada/sebelum jam 12.00 tengahari kecuali sampel untuk **ujian DNA Analysis** dan **ujian khas Hemostasis**.

Sampel untuk ujian **DNA Analysis** dan **ujian khas Hemostasis** hanya akan disimpan untuk tempoh masa seminggu sahaja sebelum ditolak sekiranya borang tidak lengkap.

APPENDIX 11**SENARAI UJIAN 24 JAM BAGI SETIAP UNIT DI JABATAN PATOLOGI**

	UNIT BOKIMIA	
	<ol style="list-style-type: none"> 1. Glucose 2. Buse (Sodium, Potassium, Urea) 3. Renal Profile (Buse, Creatinine) 4. Liver Function Test (LFT) 5. PE Profile (RP, LFT, Uric Acid) 6. Uric Acid 7. Amylase 8. Creatinine 9. Blood Gases 10. Serum Bilirubin Venous (SBV) 11. CSF Feme 12. CSF for Biochemistry (Glucose, Protein, Cell Count) 13. Creatinine Kinase 14. Total CK/CKMB 15. Calcium 16. Magnesium 17. Phosphate 18. Chloride 19. Lipid Profile (Cholesterol, TG) 20. HDL 21. Total Bilirubin 22. Direct Bilirubin 23. Serum Osmolality 24. Troponin I 25. Lactate 26. Lactate Dehyrdogenase (LDH) 27. BHCG (Urgent) 28. Serum Osmolality 29. Urine Paraquat 30. Urine Feme 31. Urine Pregnancy Test 32. Urine HB 33. Thyroid Function Test (TFT) - For thyroid storm cases only 	
	UNIT HEMATOLOGI	
	<ol style="list-style-type: none"> 1. Full Blood Count (FBC) 2. Prothrombin time (PT)/ Activated Partial Thrombin Time (APTT) 3. G6PD 4. Retic Count - Untuk kes hemolysis 5. D-Dimer 	
	UNIT MIKROBIOLOGI	
	<ol style="list-style-type: none"> 1. CSF gram stain 2. Denggi 	

	<ul style="list-style-type: none"> i. NS1 Antigen ii. IgM/IgG iii. Kombo (NS1 & IgG/IgM) 	
	3. Blood Film for Malaria Parasite (BFMP)	
	UNIT TRANSFUSI	
	<ul style="list-style-type: none"> 1. ABO/Rh grouping 2. Group, Screen & Hold (GSH) 3. Crossmatching (GXM) 4. Antibody Screening Test 5. Coomb's Test 6. Supply of Blood & Blood Products 	

APPENDIX 12

RECORD OF AMENDMENT/UPDATE IN LABORATORY HANDBOOK

Kemaskini bagi tahun 2020 (QM dan HOU Histositopatologi)

Bil	Perkara	Mukasurat	Perubahan/Pengemaskinian
1		All	Seragamkan format
2	The data in the laboratory handbook are valid only for our clients to use as a guideline.	4	The data in the laboratory handbook are valid only for our clients use.
3	The tables presented in the list of test represent the most current information for all test offered and available in our department.	4	The tables presented in the list of tests represent the current information for all test offered by our department.
4	Since revision of test offered is an ongoing process, users should expect revised editions of this book. Current version is posted on our website at htf.moh.gov.my.	4	Since revision of test offered is an ongoing process, users should expect revision of this book. Any new updates will be communicated through service agreement, letter, meeting minutes, memorandum etc and will be included in the revised edition. Current edition is posted on hospital website htf.moh.gov.my
5	Jabatan Patologi, Hospital Tuanku Fauziah reserves the right to make additions, deletions or modifications to the contents. With this new version dated 2 May 2019, the old version (Versi 6, 2018) is obsolete.	4	Jabatan Patologi, Hospital Tuanku Fauziah has the right to make additions, deletions or modifications to the contents. With this new edition dated 2 May 2019, the old edition (Versi 6, 2018) is obsolete.
6	HTF Pathology Laboratory Handbook Version 7, May 2019 replaces the previous version of the book, Version 6, March 2018, published in 2018. The major changes in this new version are listed below. Other minor or editorial changes were made to the general formatting and to some of the table footnotes and comments. The following are overview of major additions or changes unless otherwise noted as a “deletion.”	4	*Include the amendment list/record.

7	OBJEKTIF KUALITI JABATAN PATOLOGI HOSPITAL TUANKU FAUZIAH	4	*Please update. Got an additional new indicator. Quality indicator (Q10)
8	ADUAN (DR USMAN)	13	*Please update
9		13	*Update nombor sambungan telefon memandangkan ada perubahan pada fasiliti.
10	Semua spesimen biohazard dan berisiko tinggi perlu diuruskan mengikut peraturan yang telah ditetapkan.	14	Semua spesimen “biohazard” dan berisiko tinggi perlu diuruskan mengikut peraturan yang telah ditetapkan.
11	Spesimen untuk ujian ” SEGERA ” ini perlu diasingkan daripada permohonan ujian biasa.	14	Spesimen untuk ujian ” SEGERA ” dan seumpamanya perlu diasingkan daripada permohonan ujian biasa.
12	Hanya ujian tertentu sahaja akan diiktiraf sebagai segera	14	Hanya ujian tertentu sahaja boleh dipohon sebagai segera
13	Semua keputusan ujian akan diserahkan kepada klinik/wad sahaja. Pesakit tidak dibenarkan mengambil keputusan sendiri.	14	Semua keputusan ujian akan diserahkan kepada klinik/wad dan “authorized requestor” sahaja. Pesakit tidak dibenarkan mengambil keputusan sendiri.
14	<i>Point of Care Testing (POCT) :</i>	14	*Minta POCT team tambah, terutamanya tentang prosedur dan polisi. Saya cadangkan ia diletakkan asing.
15	Permohonan untuk Penyelidikan		*Minta jabatan fikirkan polisi dan prosedur dan masukkan dibawah tajuk ini
16	Menyediakan perkhidmatan diagnostik dalam bidang patologi kimia, mikrobiologi perubatan, hematologi, transfusi, histopatologi dan sitopatologi.	15	Menyediakan perkhidmatan diagnostik dalam bidang Patologi Kimia, Mikrobiologi Perubatan, Hematologi, Transfusi, Histopatologi dan Sitopatologi.

17	Semua spesimen diterima di Kaunter Utama KECUALI senarai ujian dibawah yang diterima di Kaunter Unit:	15	*Minta team wabak tambah kaunter khas untuk spesimen wabak.
18	Lain-lain perkara mengikut polisi setiap unit. Sila rujuk kriteria penerimaan dan penolakan setiap unit.	17	Lain-lain perkara mengikut polisi setiap unit. Sila rujuk kriteria penerimaan dan penolakan setiap unit. (Mohon refer muka surat)
19	Setiap spesimen daripada kes berisiko biohazard mestilah dilabel ' biohazard ' atau ditanda dengan simbol merah .	17	Setiap spesimen daripada kes berisiko "biohazard" mestilah dilabel atau ditanda, jika perlu.
20	Permohonan untuk ujian SEGERA / URGENT	17	Permohonan untuk ujian SEGERA
21	Lekatkan stiker atau tuliskan "SEGERA/URGENT" atau sebagainya pada borang permohonan ujian.	17	Lekatkan stiker atau tuliskan "SEGERA" atau seumpamanya pada borang permohonan ujian.
22	Spesimen yang dilabel "SEGERA/URGENT" atau sebagainya akan diberi keutamaan di kaunter penerimaan makmal Patologi.	18	Spesimen yang dilabel "SEGERA" atau seumpamanya akan diberi keutamaan di kaunter penerimaan Makmal Patologi.
23		18	Tambah selepas di atas: " Sampel ujian segera tidak boleh dihantar menggunakan tiub pneumatik"
24		18	Minta HOU Pengurusan tambah tatacara menggunakan Tiub Pneumatik: -Ujian apa boleh -Ujian apa tidak boleh -Bila kita cetak tarikh penerimaan etc -Tempoh masa penghantaran semula (30 minit) daripada

25	Sila rujuk “Guidelines on Urgent Test Requests” di Appendix 9 . Nota: Pastikan permohonan ujian “SEGERA/URGENT” adalah hanya untuk kes yang memerlukan rawatan segera. Penyalahgunaan permohonan “SEGERA/URGENT” akan melambatkan TAT (<i>turn around time</i>) untuk ujian yang betul-betul memerlukan keputusannya secara SEGERA.	18	Sila rujuk “Guidelines on Urgent Test Requests” di Appendix 9 . Nota: Pastikan permohonan ujian “SEGERA” adalah hanya untuk kes yang memerlukan rawatan segera. Penyalahgunaan permohonan “SEGERA” akan melambatkan TAT (<i>turnaround time</i>) untuk ujian yang betul-betul memerlukan keputusannya secara SEGERA.
26	Keputusan ujian yang sulit (seperti ujian HPE, HIV dan lain-lain) akan dihantar di dalam sampul surat.	18	Keputusan ujian yang sulit (seperti HIV dan lain-lain) akan dihantar di dalam sampul surat.
27	Pihak jabatan akan berusaha untuk menyiasat semua aduan dan maklumbalas akan diberi kepada pelanggan dalam tempoh 3 minggu .	20	Pihak jabatan akan berusaha untuk menyiasat semua aduan dan maklumbalas akan diberi kepada pelanggan dalam tempoh 14 hari .
28			Minta Team wabak letakkan tatacara pengurusan spesimen wabak
29	TATACARA PENGAMBILAN DAN PENGHANTARAN SPESIMEN UNTUK KES MEDICOLEGAL (<i>RAPE CASE</i>)	23	*Minta U36 kemaskini tatacara permohonan ujian medicolegal. Daripada pengambilan sehingga penghantaran spesimen ke kaunter.
30	Lakukan palitan (<i>smear</i>) pada slaid dan celupkan dengan segera kedalam 95 % alkohol selama 15 minit atau <i>cyto spray</i> .	23	Lakukan palitan (<i>smear</i>) pada slaid dan celupkan dengan segera ke dalam 95% alkohol selama 15 minit atau <i>cyto spray</i> .
31	*Ujian spermatozoa tidak lagi ditawarkan oleh makmal ini berdasarkan panduan yang digariskan dalam “ <i>Guideline on Standardization of Workload Data Collection 4th Edition 2016</i> ”. Semua ujian perlu dirujuk kepada Jabatan Kimia, Pulau Pinang.	23	(Bold) *Ujian spermatozoa tidak lagi ditawarkan oleh makmal ini berdasarkan panduan yang digariskan dalam “ <i>Guideline on Standardization of Workload Data Collection 4th Edition 2016</i> ”. Semua ujian perlu dirujuk kepada Jabatan Kimia, Pulau Pinang.

32	TATACARA PENGAMBILAN DAN PENGHANTARAN SPESIMEN UNTUK KES PENDERMAAN ORGAN	24	*Minta jabatan kemaskini tatacara permohonan ujian untuk kes pendermaan organ. Daripada pengambilan sehingga penghantaran semula keputusan.
33			Minta jabatan letak polisi dan prosedur untuk permohonan ujian untuk penyelidikan.
34	TEMPOH PENGELUARAN KEPUTUSAN SELEPAS PENERIMAAN SPECIMEN	27	*Tetiba masuk LTAT. Cuba ubah semula susunatur supaya seragam.
35			Semua rujukan diletak dibelakang sekali untuk seragam. Boleh guna style research.
36		44, 47, 53	Buang letter hear tersebut kerana ia tidak seragam.
37	<p>POLISI UMUM UNIT HISTOSITOPATOLOGI: PENGHANTARAN TISU UNTUK PEMERIKSAAN HISTOPATOLOGI / SITOLOGI</p> <p>1. Pada amnya, kes-kes yang memerlukan diagnosis Histopatologi, tisu atau organ yang dikeluarkan dari tubuh melalui pembedahan atau prosidur lain hendaklah dihantar keseluruhannya ke Jabatan Patologi, Hospital Tuanku Fauziah. Pengecualian terhadap perkara di atas adalah:</p> <p>a. Pemotongan anggota badan (amputation) untuk tumor yang telah dilakukan diagnosis, hanya sebahagian / keseluruhan tumor dan surgical margins perlu dihantar.</p> <p>2. Kes-kes seperti ketumbuhan yang berulang adalah perlu dihantar untuk ujian Histopatologi walaupun diagnosis telah dilakukan sebelumnya.</p> <p>3. Perkhidmatan "Frozen Section"</p>	54	<p>GENERAL POLICY OF THE HISTOCYTOPATHOLOGY UNIT: DELIVERY OF TISSUE FOR HISTOPATHOLOGICAL / SITOLOGICAL EXAMINATION</p> <p>1. Generally, cases requiring a Histopatological diagnosis the tissue or organ removed from the body through surgery or other procedures shall be sent in whole to the Department of Pathology, Tuanku Fauziah Hospital. The exceptions to the above are:</p> <p>A. Limb cutting (amputation) for tumours that have been diagnosed, only partial/whole tumors and surgical margins should be examined.</p> <p>2. Cases such as recurrent tumour are required to be sent for Histopatological testing even if a diagnosis has been done before.</p> <p>3. Frozen Section services are not available in the Pathology Laboratory, HTF. The specialists who requiring such services should discuss with pathologists on service needs and the</p>

	adalah tidak disediakan di makmal Patologi, HTF. Pakar klinikal yang memerlukan perkhidmatan tersebut perlu berbincang dengan pakar patologi berkenaan keperluan perkhidmatan		possibility of referring patients to hospitals that provide such services.
38	Perkhidmatan “Frozen Section” adalah tidak disediakan di makmal Patologi, HTF. Pakar klinikal yang memerlukan perkhidmatan tersebut perlu berbincang dengan pakar patologi berkenaan keperluan perkhidmatan dan kemungkinan merujuk pesakit ke hospital yang memberi perkhidmatan tersebut.	54	Perkhidmatan “Frozen Section” tidak disediakan di makmal Patologi, HTF. Pakar perubatan yang memerlukan perkhidmatan tersebut perlu berbincang dengan pakar patologi anatomik tentang keperluan perkhidmatan dan kemungkinan merujuk pesakit ke hospital yang memberi perkhidmatan tersebut.
39	Use PER-PAT 301 carbonized request form filled in with relevant clinical information for all histopathological examination requests. If the report is needed urgently, please mark the request form URGENT clearly at the top right hand corner.	54	Use PER-PAT 301 request form filled in with relevant clinical information for all histopathological examination requests. If the report is needed urgently, please mark the request form URGENT clearly at the top right-hand corner.
40	Histopathology Laboratory requires a set of request form (2 carbonized copies) for each request. A request with multiple specimens only requires one set of request form.	54	Histopathology Laboratory requires only 1 copy of request form for each case. A request with multiple specimens from a patient only requires one copy of request form.
41	i. Clinical Autopsy or postmortem examination is conducted to ascertain the cause of death in non-medicolegal cases. This service is only provided for patients who died in Hospital Tuanku Fauziah.	55	i. Clinical Autopsy or postmortem examination is conducted to ascertain the cause of death in non-medicolegal cases. This service is only provided for patients who died in Hospital Tuanku Fauziah. ii. The policy and procedure for clinical autopsy is under the responsibility of Forensic Unit. Please refer to relevant document and person in charge of Forensic Unit. iii. In summary, the following procedure is as below:
42	iii. Test requested	56	iii. Test requested iv. Label on the container not the lid to avoid loss of label when the lid is removed.

43	Specimens for routine histopathological examination should be sent directly to Histopathology Laboratory (not at the common specimen reception counter)	56	Specimens for routine histopathological examination should be sent directly to Histopathology Laboratory (not to the main specimen reception counter)
44	All specimens should be sent to Histopathology Laboratory as soon as possible after resection.	56	All specimens should be sent to Histopathology Laboratory after resection.as soon as possible. However, in the case of delay, the specimen is stable in fixative (10% formalin solution) at room temperature.
45	Fresh tissue specimen for immunoflourescent staining should be sent immediately to Histopathology Laboratory	56	Fresh tissue specimen for immunoflourescent staining should be sent immediately to Histopathology Laboratory without delay.
46	Reports of biopsies for histopathological examination which are labeled 'urgent' will be available within 3 working days after receipt of specimen by the laboratory (unless the case needs further staining, second opinion etc)	56	Reports of biopsies for histopathological examination which are labelled 'urgent' will be available within 3 working days after reception of specimen (unless the specimen is a large resected specimen (more than 2cm), needs additional tests, second opinion etc)
47	Report enquiry can be made via extension 8188 (pathologist room). Accession number of the specimen (HPE number) can be obtained from the Histopathology Laboratory. The requesting doctors are welcome to discuss the cases directly with the reporting pathologist or medical officer.	56	Report enquiry can be made via extension 8188 (pathologist room or through iLAB tracing system). Accession number of the specimen (HPE number) can be obtained from the Histopathology Laboratory and iLAB. The requesting doctors are welcome to discuss the cases directly with the reporting pathologist or medical officer.
48	All histopathology report shall be collected by respective clinics/wards/departments from histopathology laboratory	56	All histopathology report shall be collected from histopathology laboratory or through iLAB by respective clinics/ wards/ departments personnel.
49	Request for second copy shall be made through Histopathology Laboratory by an authorized requestor	56	Request for second copy shall be made through Histopathology Laboratory or iLAB by an authorized requestor

50	All specimens for routine histological examination taken after office hours should be fixed in the usual manner (in formalin) in the respective OT or ward and keep at room temperature. The specimen should then be dispatched to the Histopathology Laboratory during operating working hours.	56	All histopathological examinations specimen taken after office hours should be fixed in the usual manner (in 10% formalin solution) in the respective OT/ clinic or ward and keep at room temperature. The specimen should then be dispatched to the Histopathology Laboratory during operating working hours.
51	Taking out Paraffin Blocks/Slides from Histopathology Unit	56	Taking out Paraffin Blocks/Slides/Image from Histopathology Unit
52	For certain valid reasons the unit allows the clinician to take diagnostic material (paraffin block/slide) from the Unit. The following procedures must be followed:	57	For certain valid reasons the unit allows the clinician to take diagnostic material (paraffin block/slide/image) from the Unit. The following procedures must be followed:
53	The request to borrow the diagnostic material must be made by a specialist	57	The request to get the diagnostic material must be made by a medical officer
54	The requesting specialist needs to fill up form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/JP/HISTO/B-8. Hospital director approval is needed for request from outside HTF.	57	The requestor needs to fill up form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8. Hospital director approval is needed for a request from outside HTF. Request letter is a must for the latter.
55	form should be submitted to Histopathology Laboratory	57	Form or letter should be submitted to Histopathology Laboratory
56	All specimens (tissue) sent to and officially received by Histopathology Laboratory will be kept in the unit up for 3 months.	57	All specimens (tissue) sent to and officially received by Histopathology Laboratory will be kept in the unit up for at least 3 months with few exceptions.
57	The patient or next of kin must make a formal request through authorized requestor. On behalf of the patient or next of kin, the authorized requestor must make a formal request by filling up a form 'Borang Tuntutan Spesimen HPE' HTF/JP/HISTO/B-07. This form is	57	The patient or next of kin must make a formal request through authorized requestor. On behalf of the patient or next of kin, the authorized requestor must make a formal request by filling up a form 'Borang Tuntutan Spesimen HPE' HTF/PL/Histo/B-07. This form is available at Histopathology Laboratory.

	available in Histopathology Laboratory.		
58	The tissue will be given to authorize requestor on behalf of the patient or next of kin. The patient or next of kin is not allowed to take their tissue directly from the laboratory.	57	The tissue will be given to authorize requestor on behalf of the patient or next of kin. The patient or next of kin is not allowed to take the tissue from the laboratory directly .
59	A request shall be made by filling up a form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/JP/HISTO/B-8 which available at the Histopathology Laboratory. The completed form should be submitted to the Histopathology Laboratory	57	A request shall be made by filling up a form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8 which available at the Histopathology Laboratory. The completed form should be submitted to the Histopathology Laboratory
60	The requesting doctor shall communicate directly with the Pathologist concerned followed by filling up the request form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/JP/HISTO/B-8.	57	The requesting doctor shall communicate directly with the Pathologist concerned followed by filling up the request form 'Borang Pengeluaran Blok Tisu, Slide dan Gambar Morfologi' HTF/PL/Histo/B-8 .
61	The abstract of the publication should be provided and the Pathologist concerned who reported the case should be included as co-author.	57	The abstract of the publication should be provided, and the Pathologist concerned who reported the case should be included as co-author if possible .
62	One pathologist from the unit shall be appointed as collaborator or co-researcher	58	One pathologist from the unit shall be appointed as collaborator or co-researcher if possible
63	a. The histopathology unit welcome research projects or studies to be done in collaboration with our unit	58	a. The histopathology unit welcome research projects or studies to be done in collaboration with our unit b. All research project shall be registered under National Medical Research Register (NMRR).
64	Small biopsy 6 weeks 3 working days*	58	Small biopsy 14 days 3 working days*

65	Other HPE specimen 6 weeks NA	58	Other HPE specimen 14 days NA
66	*Apply only for small biopsy less than 20mm in diameter without any special stain or repeat section.	58	*Apply only for small biopsy less than 20mm in diameter without any additional test or requiring second opinion.
67	Monday to Friday: 8.00am-5.00pm (Reception of specimen will be until 4.00pm for all specimen type except for seminal fluid analysis until 1pm).	58	Monday to Friday: 8.00am-5.00pm (Reception of specimen will be until 4.00pm for all specimen type except for seminal fluid analysis until 11am).
68	Two (2) copies of PER-PAT 301-form for routine cytological examination (Non Gynaecological Cytology, Fine Needle Aspiration and Seminal Fluid Analysis).	58	A copy of PER-PAT 301-form for routine cytological examination (Non-Gynaecological Cytology, Fine Needle Aspiration and Seminal Fluid Analysis).
69	Two (2) copies of PS 1/98 (Pindaan 2007)- form for gynaecological cytology examination	58	A copy of PS 1/98 (Pindaan 2007)-form for gynaecological cytology examination
70	If urgent result is required, please indicate so by marking 'URGENT' over the upper right hand corner of the form. Seminal fluid analysis is not included and will not consider as an urgent request.	59	If urgent result is required, please indicate so by marking 'URGENT' over the upper right-hand corner of the form. Seminal fluid analysis and gynaecological cytology are not considered as an urgent request.
71	Sputum (Specimen must be collected on three consecutive days)	59	Sputum (Specimen must be collected on three consecutive days)
72	The specimen container should be labeled according to the day the specimen is collected	59	The specimen container should be labelled according to the day the specimen is collected
73	Breast and thyroid cyst may be aspirated by the surgeon and material sent for cytology examination	61	Breast and thyroid cyst may be aspirated by the aspirator and material sent for cytology examination
74	FNAC for deep seated lesions are performed by radiologist under radiological guidance on appointment basis	61	FNAC for deep seated lesions are performed by radiologist under image guided on appointment basis. Please refer to Radiology Department policy and procedure.

75	Pap Smear 30 days 7 working days	61	Pap Smear 14 days NA
76	Non Gynae 14 working days 3 working days (for non-complex case only)	61	Non Gynae 7 days 3 working days (routine only)
77	FNAC 14 working days 3 working days (for non-complex case only)	61	FNAC 7 days 3 working days (routine only)
78	Seminal Fluid Analysis 7 working days NA	61	Seminal Fluid Analysis 3 working days NA
79	POLICY FOR HANDLING OF HPE SPECIMEN IN OPERATION THEATRE (OT), ENDOSCOPIC ROOM ETC	62	POLICY FOR HANDLING OF ANATOMIC PATHOLOGY (AP) SPECIMEN IN OPERATION THEATRE (OT), ENDOSCOPIC ROOM ETC
80	LIST OF TESTS		*Suggest to remove. Please mention it in list of tests in the next section
81			*Add policy for Highly Infectious Specimen
82	1. No risk factor mentioned in lab form for patient admitted to ward or attended clinic (all cases with * mentioned above). 2. No clinical findings mentioned in lab form suggesting patient is high risk (all cases with * mentioned above).	73	*Suggest to detail out the risk factor and clinical finding required.
83	3. Specimen sent before the expected time interval. 4. Patient already known case of infection before.	73	*Suggest detailing out type of specimen and the expected time interval. Question: Is this applicable for HEP B, HEP C and HIV?

84	<p>References:</p> <ol style="list-style-type: none"> 1. B. Amith & J.M. Ashish, SLICC Criteria for SLE. Evidence Based Medicine. October 2016. CMI: 13:4 2. Van Den Hoogen et al. 2013 Classification Criteria for Systemic Sclerosis. Arthritis & Rheumatism. 2013. DOI 10.1002/art.38098 3. Shiboski et al. 2016 American College of Rheumatology/European League Against Rheumatism Classification Criteria Primary Sjogren Syndrome. Arthritis & Rheumatology. 2016. DOI 10.1002/art.39859 4. Manns et al. Diagnosis and Management of Autoimmune Hepatitis. AASLD Practice Guideline. Hepatology. 2010. Vol.51, No.6 5. Y. Shoenfeld & P.L. Meroni. The General Practice Guide for Autoimmune Diseases. PABST Science Publisher. 2010 6. Lindor et al. Primary Biliary Cirrhosis. AASLD Practice Guideline. Hepatology. 2009. Vol. 50, No. 1 7. W.L. Gross et al. Diagnosis and Evaluation of Vasculitis. Rheumatology. 2000;39:245-252. 8. A Basic Guide to Autoimmune Testing. Clinipath pathology. Castro & Gourley. Diagnostic Testing and Interpretation Tests for Autoimmunity. J Allergy Clin Immunolog. 2010 February; 125(2 Suppl 2): S238-S247. Doi:10.1016/j.jaci.2009.09.041 	77	<p>*Put at the reference section at the end of the document. Can quote as in journal manuscript.</p>
85			<p>*Please include new rejection criteria. Note: The more u add rejection criteria, the more rejection u will get.</p>

86			*Make sure standardized format and font
87	Tarikh dan masa pengambilan spesimen WAJIB diisi terutamanya untuk semua Ujian Koagulasi		Tarikh dan masa pengambilan spesimen WAJIB diisi terutamanya untuk semua Ujian Koagulasi Note: All form must come with date and time of collection. It is a rejection criteria.
88	j) Label pada bekas spesimen hendaklah mempunyai butiran pesakit seperti berikut: - Nama Pesakit seperti di Kad Pengenalan/ Passport - No. Kad pengenalan - Ujian yang dipohon - Tarikh pengambilan spesimen	79	j) Label pada bekas spesimen hendaklah mempunyai butiran pesakit seperti berikut: - Nama Pesakit seperti di Kad Pengenalan/ Passport - No. Kad pengenalan - Ujian yang dipohon - Tarikh pengambilan spesimen *It should in the form together with time of collection. It is a rejection criteria.
89	4. Kriteria Penerimaan Spesimen di Unit Hematologi	79-80	*Suggest to remove. Please mention it in list of tests.
90	Keputusan Nilai Panik akan dimaklumkan melalui telefon kepada anggota wad atau klinik yang berkenaan dengan segera.	80	*Please give the time interval.
91			*Please add on how to trace result trough LIS. Please include the Policy and moral of etiquette as well.
92	SENARAI UJIAN DI JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS (MENGIKUT SUSUNAN ABJAD)	81-136	*Please add accreditation status (MS ISO)
93			*Please add list of consultants

94			*Please add list of test for Wabak
95	SENARAI UJIAN DAN NILAI KRITIKAL	116-117	*Standardize the table
96	This guideline is applicable for tests that are provided in 24 hours laboratory (Chemical Pathology and Haematology Unit). Please follow respective unit guideline for urgent request for other type of tests.	118	*Are all tests provided 24 hours considered as urgent?
97	These samples will usually be analysed and reported in 60 minutes (LTAT) from receipt in the laboratory.	118	*Suggest to list test and the expected LTAT
98	For request of urgent test, please separate the sample and form from the non-urgent request such as liver function test, fasting serum lipid etc.	118	For request of urgent test, please separate the sample and form from the non-urgent request such as liver function test, fasting serum lipid etc. These requests shall be transported manually to specimen reception counter
99	If it is in the same tube and same form, it will be treated as non-urgent regardless of the 'Urgent' label (due to difficulty in sorting the test).	119	Should the urgent and non-urgent request are send together in a same tube and form, or transported through "pneumatic tube system", it will be managed as non-urgent regardless of the 'Urgent' label (due to difficulty in sorting the test).
100			*Standardized format and font
101	Spesimen mestilah disertakan dengan 2 helaian borang permintaan PER PAT 301 (Borang PS1/98 (Pindaan 2007) untuk Pap smear).	127	Spesimen mestilah disertakan dengan 1 helaian borang permintaan PER PAT 301 (Borang PS1/98 (Pindaan 2007) untuk Pap smear).
102			*Standardized format and font

103	Pesakit mempunyai hak untuk merasakan tiada maklumat peribadi yang diberikan semasa proses rawatan boleh didedahkan melainkan setelah mendapat persetujuan (consent) daripada mereka.	25	Pesakit, penderma darah dan pengamal perubatan (selepas ini dirangkum diganti dengan “pelanggan”) mempunyai hak untuk merasakan tiada maklumat peribadi yang diberikan semasa proses rawatan dan pendermaan darah boleh didedahkan melainkan setelah mendapat persetujuan (consent) daripada mereka.
104	dengan persetujuan pesakit (consent);	25	dengan persetujuan pelanggan (consent);
105	Makmal ini akan sedaya upaya akan memastikan semua maklumat pesakit diserahkan kepada pemohon yang berhak sahaja (selepas ini akan digantikan dengan “authorized requestor”).	25	Makmal ini akan sedaya upaya akan memastikan semua maklumat pelanggan diserahkan kepada pemohon yang berhak sahaja (selepas ini akan digantikan dengan “authorized requestor”).
106	Makmal ini akan memastikan sebarang kaedah pendedahan maklumat pesakit kepada “authorized requestor” dengan menggunakan mana-mana teknologi (telefon, faks, email, surat, “web-based” dan sebagainya perlu mengikut proses dan prosedur tertentu bagi memastikan kerahsiaan maklumat pesakit senantiasa dilindungi.		Makmal ini akan memastikan sebarang kaedah pendedahan maklumat pelanggan kepada “authorized requestor” dengan menggunakan mana-mana teknologi (telefon, faks, email, surat, “web-based” dan sebagainya perlu mengikut proses dan prosedur tertentu bagi memastikan kerahsiaan maklumat pesakit senantiasa dilindungi.
107	Pihak Makmal ini akan mengelak dari berbincang berkenaan pesakit ditempat yang terbuka yang mana berisiko didengari oleh pihak ketiga atau meletakkan maklumat pesakit (samada di atas kertas atau pada skrin computer) dimerata-rata tempat yang mana boleh dilihat oleh orang tidak berkenaan. Jika perbincangan perlu dilakukan, ia akan dilakukan ditempat yang tertutup.	25	Pihak Makmal ini akan mengelak dari berbincang berkenaan pelanggan ditempat yang terbuka yang mana berisiko didengari oleh pihak ketiga atau meletakkan maklumat pelanggan (samada di atas kertas atau pada skrin computer) dimerata-rata tempat yang mana boleh dilihat oleh orang tidak berkenaan. Jika perbincangan perlu dilakukan, ia akan dilakukan ditempat yang tertutup.

108	Makmal ini akan menyediakan proses dan prosedur kerja untuk memastikan sistem rekod maklumat pesakit diurus dengan teratur dan seterusnya dapat melindungi data peribadi pesakit.	25	Makmal ini akan menyediakan proses dan prosedur kerja untuk memastikan sistem rekod maklumat pelanggan diurus dengan teratur dan seterusnya dapat melindungi data peribadi pelanggan .
109	Makmal ini akan melantik seorang atau beberapa orang pengurus untuk menguruskan sistem maklumat makmal (selepas ini akan digantikan dengan "LIS"). Pengurus LIS ini akan sentiasa memastikan integriti sistem, keselamatan maklumat dan kerahsiaan data peribadi pesakit terlindung.	25	Makmal ini akan melantik seorang atau beberapa orang pengurus untuk menguruskan sistem maklumat makmal (selepas ini akan digantikan dengan "LIS"). Pengurus LIS ini akan sentiasa memastikan integriti sistem, keselamatan maklumat dan kerahsiaan data peribadi pelanggan terlindung.
110	Makmal ini akan menjaga sensitiviti dengan memastikan pesakit "Very Important Person" (selepas ini digantikan dengan VIP), medikolegal dan sebagai yang dirasakan perlu, tidak akan didedahkan pada paparan skrin LIS.	26	Makmal ini akan menjaga sensitiviti dengan memastikan pesakit "Very Important Person" (selepas ini digantikan dengan VIP), medikolegal dan sebagainya yang dirasakan perlu, tidak akan didedahkan pada paparan skrin LIS.
111		25-26	Tukar pesakit kepada pelanggan
112	Critical Value Histosito	116-117	Tamahan seperti dilampiran di bawah

Kemaskini bagi tahun 2020 (Unit Mikrobiologi)

Bil	Perkara	Mukasurat	Perubahan/Pengemaskinian
1	KETUA UNIT/PAKAR KLINIKAL MIKROBIOLOGI	13	PEGAWAI SAINS/PAKAR KLINIKAL MIKROBIOLOGI
2	Prosedur Permohonan Ujian a) Semua permohonan ujian perlu menggunakan borang yang telah ditetapkan : (Tambahan)	16	TBIS 20C Semua ujian berkaitan dengan Mycobacterium tuberculosis (Kecuali Blod culture for MTB) IMR/AIRC/Autoimmune/RF Ujian Autoimmune (Kecuali ANA/ANCA/ENA dan Tissue Antibodies) Bacteriology request form Bordetella pertussis PCR/B.pseudomallei IgM/Brucella PCR/Brucella serology/Lepto MAT/Lepto PCR/Rickettsia serology/
	TBIS 20C		Semua ujian berkaitan dengan Mycobacterium tuberculosis (Kecuali Blod culture for MTB)
	IMR/AIRC/Autoimmune/RF		Ujian Autoimmune (Kecuali ANA/ANCA/ENA dan Tissue Antibodies)
	IMR/BACT/FORMS/SMIS/01		Ujian-ujian rutin Unit Bakteriologi IMR
	IMR/IDRC/BACT/LEPTO/01		Leptospira PCR Leptospira MAT Leptospira Culture
	IMR/IDRC/BACT/BRUCE/01		Brucella PCR Brucella Serology Brucella Culture identification Brucella Culture for PCR

	IMR/IDRC/BACT/RICK/02		Indirect Immunoperoxidase (IIP) Test
3	Ujian HIV/HBV/VDRL	23	Ujian HIV/HBV/HCV/VDRL
4	<u>Ujian <i>Chlamydia trachomatis</i> antigen</u> Lakukan palitan pada slaid dan biarkan kering di udara (air dry) *Makmal Mikrobiologi akan melakukan fixation menggunakan metanol sebelum dihantar ke makmal rujukan	23	Removed. Test not done.
5	INDICATION FOR INFECTIOUS DISEASE SCREENING	71	To update new criteria
6	INTERVAL FOR INFECTIOUS SCREENING IN SPECIFIC CONDITION	73	New updated interval
7	*To consult clinical microbiologist if there is justification to perform the test in case patient does not fulfill criteria above.	73	Add after: * Please separate RPR/VDRL test from HIV/HBsAg/Hep C antibody/Hep B surface antibody.
8	CLINICAL CRITERIA FOR AUTOIMMUNE DISEASES	74	New updated criteria
9	3. Acid Fast Bacilli (AFB) smear	81	TBIS 20C
10	16. Anti-thyroid antibodies a. Anti thyroid peroxidase antibody (ATPO) b. Anti thyroglobulin antibody (ATG)	82	Removed. Test not done

11	Add new test: 33. Coronavirus Disease (COVID-19) Rapid Test Kit Antigen (RTK-Ag)	83	Mikro Nasopharyngeal swab 1 jam *Please request for kit & send specimen in ice
12	38. Blood (Utk Kes Yg Disyaki Catheter-Related Bloodstream Infection (Crbsi), Dapatkan Sampel Drpd Central Dan Peripheral Line)	84	To add Pada masa yang sama
13	38-39 *Keputusan awal dikeluarkan selepas 48jam	84	To add *Sila catat masa pengambilan darah
14	40. Blood Culture Bottle (Myco)	84	To add / F Lytic)
15	45. Amies	84	To add /Amies with charcoal
16	47. Sterile Bijou Bottle	84	To add /Sterile container
17	48-50. Amies	85	To add /Amies with charcoal
18	51. Basahkan swab steril dengan saline sebelum mengambil spesimen. Hantar secepat mungkin.	85	Add after *Sila guna satu swab untuk swab nasal kanan dan kiri
19	52. Sterile Bijou Bottle Anaerobe: RCMM	85	/Sterile container
20	60. Sterile/ Amies	86	To add /Amies with charcoal

21	61. Pungut	86	Change to Kumpul
22	111. Legionella (antigen)	92	Move to outsource list. outsouce to bahiyah
23	162. Catatan	97	*Sila asingkan ujian RPR/VDRL daripada ujian saringan HIV/Hep B/Hep C
24	Add new test Respiratory Virus Antigen (Influenzae A&B/Adenovirus/RSV)		Mikro-
25	45. Burkholderia pseudomallei (Meliodosis) serology (IgM)	102	To update new form (IMR)
26	Add new test Covid-19 PCR		-Swab in VTM-HSB/MKA-
27	Add new test Covid-19T Tissue/Environmental culture		IMR NIH test imr baru -skin antibodies -Membranous nephropathy
28	101. HIV Viral load (Quantitative)		Referral lab: HSB
29	120. Leptospira PCR 122. MERS-CoV PCR 124. MTB C&S 125. MTB GeneXpert 126. MTB PCR 137. Polio virus isolation (Acute flaccid paralysis)	110-112	To update new form (IMR/TBIS)

30	146. Respiratory virus 154. Typhidot	114	Removed. Test not done
31	Add new test: Viral culture	115	
32	KRITERIA PENOLAKAN UNIT MIKROBIOLOGI	128	Shared test (Different platform)
33	ABREVIASI/SINGKATAN		COVID-19 : Coronavirus Disease NARL : National AIDS Reference Laboratory

Kemaskini bagi tahun 2020 (Unit Perubatan Transfusi)

Bil	Perkara	Mukasurat	Perubahan/Pengemaskinian
1	Remove No. 22 Antibody Titration for Anti-D (anti-D titre)	Page: 99 of 136	Remove
2	Amend No. 21 Antibody Identification	Page: 99 of 136	Amendment as attached
3	Add new test	-	Amendment as attached
4	Penukaran nombor di dalam dokumen	M/S 28-43	Seperti didalam lampiran
5	Hapus polisi 2.3	M/S 29	Seperti didalam lampiran
6	Penambahbaikan dari segi prosedur kerja termasuk sampel validiti	M/S 28-43	Seperti didalam lampiran
7	Polisi pembekalan darah ditambahbaik dengan penambahan ujian keserasian darah (GXM)	M/S 28-43	Seperti didalam lampiran
8	Istilah tabung darah ditukar kepada Makmal Transfusi	M/S 28-43	Seperti didalam lampiran
9	Penambahan tanggungjawab dengan memasukkan PPP selain JT	M/S 28-43	Seperti didalam lampiran

10	Penambahbaikan ringkasan tatacara proses transfusi (sebelum, semasa dan selepas) dengan penambahan pemulangan darah/ komponen darah yang tidak digunakan selepas diambil	M/S 28-43	Seperti didalam lampiran
11	Semakan semula <i>Maximum Surgical Blood Ordering Schedule (MSBOS)</i> Disember 2020.	M/S 44-48	Seperti didalam lampiran

Kemaskini bagi tahun 2020 (Unit Patologi Kimia)

Bil	Perkara	Mukasurat	Perubahan/Pengemaskinian
1	Polisi umum jbtn 8.Point of Care Testing (POCT) :a.Untuk memulakan sesuatu perkhidmatan POCT, ianya akan melibatkan Pengarah Hospital, pakar-pakar klinikal dan pakar patologi.	14	8.Point of Care Testing (POCT) :a.Untuk memulakan sesuatu perkhidmatan POCT, ianya akan melibatkan Jawatankuasa POCT Hospital
2	Urgent & 24 hr service Most tests are run daily, specimens which arrive early in the morning, are processed by mid day and most of the results will be ready by the end of the day for routine chemistry tests. Some of immunoassay tests and special tests shall be analysed in batches for cost effectiveness purposes.	63	Urgent & 24 hr service Most tests are run daily, specimens which arrive early in the morning, are processed within 4 hours for routine chemistry tests. Some of immunoassay tests and special tests shall be analysed in batches for cost effectiveness purposes.
3	Urgent & 24 hr service 8.TFT (TRO Thyroid storm) 9.Urine Paraquat 10.TDM (PCM) 11.Ammonia	63	Urgent & 24 hr service 8.TFT (TRO Thyroid storm)* 9.Urine Paraquat 10.TDM (PCM)** 11.Ammonia* Please discuss with chemical pathologist* / pharmacist ** before sending
4	LIST OF TESTS a) General chemistry	64	LIST OF TESTS a) General chemistry Add no 17 Profile/ujian-Procalcitonin Bekas –EDTA Catitan- untuk kes COVID-19 sahaja
5	Fasting Blood Sugar Blood should be collected after an overnight fasting for at least 8 hours with no calories intake.24-hours urine collection is required due to circadian rhythmic changes in excretion at different time of the day.	67	Fasting Blood Sugar Blood should be collected after an overnight fasting for at least 9 hours with no calories intake. 24-hours urine collection is required due to circadian rhythmic changes in excretion at different time of the day. (delete yg in red kecuali yg no 9 tu., typo kot ni, lari dr tajuk)
6	Pembetulan specimen container bagi ujian Troponin I Container: Lithium Heparin	96	Perubahan: Tiub yang digunakan ialah tube <u>EDTA</u> Adult : 2ml Paed : 0.5ml

Kemaskini bagi tahun 2020 (Unit Hematologi)

Bil	Perkara	Mukasurat	Perubahan/Pengemaskinian
1	No sambungan ketua unit hematologi	13	8203
2	Pertukaran borang permohonan ujian PPDK 11 bagi FBP,BMAT dan Hb analysis	16	Borang PERPAT 301 untuk FBP,BMAT dan HB analysis
3	Borang obsolete	16	Dikeluarkan borang HA-HEMA 2011-2 special hematologi lab requisition for cytogenome
4	Borang baru untuk ujian genetic bagi kes hemophilia		Borang DNA analysis untuk haemophilia A hantar ke PDN (Doc No.:PDN/HA/QP-01/01) dan haemophilia B hantar ke IMR(Molecular analysis for Hemophilia).
5	Perubahan pada References: STR version 2012 ke version 2017	45	STR- SPECIFIC TECHNICAL REQUIREMENTS FOR ACCREDITATION OF HAEMATOLOGY LABORATORIES. Issue 5, 16 October 2017 (Supplementary to MS ISO 15189:2014)
6	Bahagian Unit Hematologi , waktu perkhidmatan ,penambahan pada G6PD	78	Selepas waktu pejabat: Hanya dijalankan sehari sekali pada hujung minggu dan cuti umum.
7	3 d. Ringkasan klinikal	78	Ringkasan klinikal diperlukan untuk ujian bone marrow aspirate dan trephine biopsy
8	3. f – Kleihauer test ; Lap score	78	Ujian tidak ditawarkan lagi
9	Senarai ujian no.53. Spesimen untuk ujian CD4/CD8 perlu dihantar pada hari Isnin sebelum 4.30 petang atau pada hari Selasa sebelum jam 10.00 pagi.	102	Spesimen untuk ujian CD4/CD8 perlu dihantar pada hari Isnin sebelum 4.30 petang.

10	4. Kriteria Penerimaan Spesimen di Unit Hematologi	80	No 12. Kleihauer dan no 14. Lap score dikeluarkan
11	SENARAI UJIAN DI JABATAN PATOLOGI, HOSPITAL TUANKU FAUZIAH, KANGAR, PERLIS	82	25.BMA Borang baru (pindaan borang PPDk11 ke PERPAT 301 dan Tambah ringkasan klinikal pada ruangan catatan/rujukan
12	Pemansuhan borang ppdk 11 bagi Ujian FBP ,pada senarai ujian no 93	90	Borang ppdk 11 dimansuhkan dan digantikan dengan boring perpat 301
13	Senarai ujian no 95.Pindaan TAT ujian G6PD	90	TAT ujian G6PD : 24 jam
14	Senarai ujian no.107 dan 109	92	Remove Kleihauer dan Lap score
15	Senarai ujian no 135 bagi mixing test,pindaan bilangan tiub sampel	94	Jumlah specimen : 1.8ml x 2
16	Angiotensin Converting Enzyme (ACE)	99	Unit : Patologi Kimia
17	Chromosome Study	103	Harga : Tiada Makmal Rujukan : Hospital Tuanku Azizah (Hospital Wanita & Kanak-Kanak Kuala Lumpur) Catatan/Rujukan: Blood sample must arrive at lab HTA within 24 hours.
18	DNA Analysis (Alpha thalassemia)	105	Unit : Hema Bekas : EDTA Jenis Spesimen : Blood Isipadu : 2ml Penghantaran : Send immediately to the lab Jadual : Office hour TAT(Referral Lab) : 120 hari Borang : DNA Ana for Thal Synd & Hbpathy(s) REQform and consent form IMR/CaRC/HAEM/22/2203/03(1)/REQForm

			Harga: Tiada Makmal Rujukan: Hospital Sultanah Bahiyah Catatan: Tiada
19	DNA Analysis (Beta thalassemia)	105	Unit : Hema Bekas : EDTA Jenis Spesimen : Blood Isipadu : 2ml Penghantaran : Send immediately to the lab Jadual : Office hour TAT(Referral Lab) : 90 hari Borang : DNA Ana for Thal Synd & Hbpathy(s) REQform and consent form IMR/CaRC/HAEM/22/2203/03(1)/REQForm Harga: Tiada Makmal Rujukan: IMR Catatan: Tiada
20	Immunophenotyping (Leukemia/ Lymphoma /PNH)	109	Makmal Rujukan: Hospital Tuanku Azizah (Hospital Wanita & Kanak-Kanak Kuala Lumpur) Catatan/Rujukan: Blood sample must arrive at lab HTA within 24 hours.
21	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Tiada borang permohonan atau borang yang salah - TOLAK	155	Tiada borang permohonan atau borang yang salah - TOLAK DAN DIBENARKAN PEMBETULAN
22	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Tiada nama/cop nama/tandatangan/ nama pegawai perubatan tidak jelas	155	Tiada nama/cop nama/tandatangan/ nama pegawai perubatan/pakar perubatan tidak jelas
23	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Spesimen beku/lisis/tumpah/tidak menepati isipadu ditetapkan/tiada spesimen	155	Spesimen beku/lisis/tumpah/icteric/tidak menepati isipadu ditetapkan/tiada spesimen

24	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Ujian khas Hemostasis (Fibrinogen, Factor 8 & 9 Level, Factor 8 & 9 Level) yang dihantar selepas waktu pejabat	155	Ujian khas Hemostasis (Fibrinogen, Factor 8 & 9 Level, Factor 8 & 9 Level) yang dihantar selepas waktu pejabat
25	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Tiada masa pengambilan spesimen - TOLAK	156	Tiada masa pengambilan spesimen - TOLAK DAN DIBENARKAN PEMBETULAN
26	Appendix 10. KRITERIA PENOLAKAN UNIT HEMATOLOGI Ujian Makmal Rujukan yang dihantar selepas waktu pejabat	156	Ujian Makmal Rujukan yang dihantar selepas waktu pejabat (ujian IPT dan cytogenetic study)

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