

PMMPMHAMB HOSPITAL LABORATORY TUTONG

Introduction

The laboratory provides a range of services which includes; phlebotomy, specimen reception, lab testing, blood donation and laboratory consumable stock distribution.

Our Services

Phlebotomy and Sample Reception

Phlebotomy services are provided in the hospital and in the health centres in the Tutong District (Lamunin, Kelugos and Telisai). Specimens are received from locations within the hospital and the Healthcare Facilities in Tutong which include the Health Centres, Dialysis Centre, Detention Centre, and Army Medical Clinics.



Testing of Specimens

Laboratory testing are performed for routine tests in the disciplines of Clinical Chemistry, Haematology and Microbiology. Tests which are not performed in the laboratory will be referred to Reference Laboratories in RIPAS Hospital and in Sumbiling Biomedical Research Unit.



Blood Donation

Walk-in blood donors are accepted for donation during normal working hours. Blood donation campaign is regularly organised.



Distribution of Laboratory Consumables

Laboratory consumables are distributed upon request to relevant locations.

CONTACT

📍 1st Floor, PMMPMHAMB Hospital, Tutong TA1541
☎ Telephone: 4221010, 4221011 ext 224, 225, 226

Address

Phlebotomy and Specimen Receiving
Ground Floor

Laboratory
1st Floor
PMMPMHAMB Hospital
Tutong TA1541



Contact

Telephone: 4221010, 4221011

Head of Section	EXT 227
Reception Counter (Laboratory)	EXT 219
Reception Counter (Phlebotomy)	EXT 144
Haematology	EXT 226
Clinical Chemistry	EXT 224
Microbiology	EXT 225

Laboratory Personnel

Head of Section: Hajah Jety Nasriah binti Haji Abdullah
Deputy Head of Section: Zaki bin Amat Daud

Staff: Scientific Officer	(5)
Technologist	(1)
Chief Lab Technician	(1)
Senior Lab Technician	(1)
Lab Technician	(5)
Laboratory Assistant/Phlebotomist/Attendant	(10)

Operating Hours

Monday to Thursday and Saturday

Phlebotomy (Hospital)	7:45 am – 12:15 noon, 1:30 pm – 4:15 pm
Phlebotomy (Health Center)	7:30 am – 10:00 am
Blood Donation	8:00 am – 11:30 am, 1:45 pm – 4:00 pm
Stock Distribution	2:00 pm – 4:00 pm

Daily

Specimen receiving	24 hours
Lab Testing	24 hours

PMMPMHAMB HOSPITAL LABORATORY TEST CATALOGUE

A) CLINICAL CHEMISTRY

1. Alanine Transaminase (ALT)				Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)			
Unacceptable	Haemolysed			
Method	UV absorbance			
TAT	Routine: 1 day, STAT: 1.5 hours			
Clinical Usage	Liver profile assessment			
Reference Range	Male	10 – 50	IU/L	
	Female	10 – 35	IU/L	

2. Albumin, Serum		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Lipemic	
Method	Colorimetric	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Liver profile assessment	
Reference Range	35 – 52 g/L	

3. Albumin/Creatinine Ratio (ACR)			Clinical Chemistry (ext 224)
Specimen	Random urine - 20mL in sterile screw-capped container, no preservative, preferred early morning urine specimen		
Method	Calculated from Urine Albumin and Urine Creatinine		
TAT	1 day		
Clinical Usage	Early detection of diabetic nephropathy		
Reference Range	< 3.0	mg/mmol	Normal to mildly increased
	3.0 – 30.0	mg/mmol	Moderately increased
	> 30.0	mg/mmol	Severely increased

4. Alkaline Phosphatase (ALP)				Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)			
Unacceptable	Haemolysed			
Method	Colorimetric			
TAT	Routine: 1 day, STAT: 1.5 hours			
Clinical Usage	Liver and bone profile assessment			
Reference Range	Male	40 – 129	IU/L	
	Female	35 – 104	IU/L	

5. Amylase		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Enzymatic Colorimetric	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Diagnosis of pancreatitis	
Reference Range	28 – 100 U/L	

6. Ascitic Fluid Chemistry		Clinical Chemistry (ext 224)
Specimen	Fluid in screw-capped container. Send as a pair with serum sample.	
Method	Panel/Individual Test: Albumin, Total Protein, Amylase	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of ascitic fluid accumulation	

7. Bence Jones Protein, Urine (Screening)		Clinical Chemistry (ext 224)
Specimen	Random urine - 20mL in sterile screw-capped container, no preservative, preferred early morning urine specimen	
Unacceptable	Overnight at room temperature	
Method	Bradshaw's test	
TAT	1 day	
Clinical Usage	Screening test for multiple myeloma and amyloidosis	
Reference	Not detected	

8. Bicarbonate, Serum (HCO₃)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Add-on request	
Transport	Send to the Lab immediately	
Method	UV Absorbance	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Acid-base balance evaluation	
Reference Range	22 – 29 mmol/L	

9. Bilirubin, Direct		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Transport	Protect sample from light and send to the Lab	
Unacceptable	Haemolysed	
Method	Colorimetric (Diazo)	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Differential diagnosis of jaundice	
Reference Range	≤ 3.4 µmol/L	

10. Bilirubin, Total		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Transport	Protect sample from light and send to the Lab	
Unacceptable	Haemolysed	
Method	Colorimetric (Diazo)	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Evaluation of neonatal jaundice and liver function	
Reference Range	≤ 21 µmol/L	

11. Blood Gases, Arterial				Clinical Chemistry (ext 224)
Specimen	Blood (Heparinised syringe or capillary tube)			
Transport	Specimen in ice, send to the Lab immediately			
Unacceptable	Clotted, specimen not chilled, bubbles in blood			
Method	Potentiometry, Calculated			
TAT	Routine: 1 day, STAT: 10 minutes			
Clinical Usage	Evaluation of acid-base status			
Reference Range	pH		7.35 – 7.45	
	pCO2	Male	35 – 48	mmHg
			32 - 45	mmHg
	Female			
	pO2		83 – 108	mmHg
	Bicarbonate-Act	Male	22 – 28	mmol/L
			21.2 – 27.0	mmol/L
	Female			
	BE	Male	-3.2 – 1.8	mmol/L
			-2.3 – 2.7	mmol/L
Female				
O2 Saturation		95 – 99	%	

12. Blood Gases, Venous		Clinical Chemistry (ext 224)	
Specimen	Blood (Heparinised syringe or capillary tube)		
Transport	Specimen in ice, send to the Lab immediately		
Unacceptable	Clotted, specimen not chilled, bubbles in blood		
Method	Potentiometry, Calculated		
TAT	Routine: 1 day, STAT: 10 minutes		
Clinical Usage	Evaluation of acid-base status		
Reference Range	pH	7.32 – 7.43	
	pCO2	N/A	mmHg
	pO2	N/A	mmHg
	Bicarbonate	24 - 30	mmol/L
	BE	N/A	mmol/L
	O2 Saturation	N/A	%

13. Bone Panel		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Panel test: Calcium, Phosphate, ALP.	
Performed	Daily	
TAT	1 day	
Clinical Usage	Bone profile assessment	
Reference Range	Refer to individual analytes	

14. Calcium, ionized		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Potentiometry	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Evaluation of calcium metabolism	
Reference Range	1.16 – 1.32 mmol/L	

15. Calcium, Total		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	UV Absorbance	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Evaluation of calcium metabolism	
Reference Range	2.15 – 2.50 mmol/L	

16. Chloride (Cl)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Indirect ISE	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Electrolyte balance assessment	
Reference Range	98 – 107 mmol/L	

17. Cholesterol, HDL		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Homogeneous, Colorimetric	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of lipid status	
Reference Range	Low < 1.00 mmol/L Desirable ≥ 1.60 mmol/L	

18. Cholesterol, LDL		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Calculated (Friedewald formula)	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of lipid status	
Reference Range	Optimal < 2.59 mmol/L	

19. Cholesterol, Total		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Enzymatic, Colorimetric	
TAT	1 day	
Clinical Usage	Evaluation of lipid status	
Reference Range	Desirable < 5.18 mmol/L	

20. C-Reactive Protein (CRP)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Immunoturbidimetric	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Marker of inflammation	
Reference Range	< 0.5 mg/dL	

21. Creatine Kinase (CK)				Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)			
Unacceptable	Haemolysed, overnight			
Method	UV Absorbance			
Performed	Daily			
TAT	Routine: 1 day, STAT: 1.5 hours			
Clinical Usage	Assessment of cardiac & skeletal muscle disorders			
Reference Range	Male	39 – 308	U/L	
	Female	26 – 192	U/L	

22. Creatinine		Clinical Chemistry (ext 224)	
Specimen	Blood (SSTII gold top, 3mL)		
Method	Colorimetric (Jaffe rate)		
Performed	Daily		
TAT	Routine: 1 day, STAT: 1.5 hours		
Clinical Usage	Diagnosis and treatment of renal diseases, monitoring renal dialysis		
Reference Range	Male	62 – 106	µmol/L
	Female	44 – 80	µmol/L

23. Creatinine, Urine		Clinical Chemistry (ext 224)		
Specimen	Random urine, 20mL in sterile screw-capped container or 24-hr Urine collection (Urine container, without preservative)			
Method	Colorimetric (Jaffe rate)			
Performed	Daily			
TAT	Routine: 1 day			
Clinical Usage	Diagnosis and treatment of renal diseases, monitoring renal dialysis			
Reference Range		Male	Female	
	Random	3.45 – 22.9	2.47 – 19.2	mmol/L
	24 Hour	9.0 – 21.0	7.0 – 14.0	mmol/L

24. CSF Chemistry (Glucose, Total Protein and Lactate)				Clinical Chemistry (ext 224)
Specimen	CSF – 1mL, in sterile screw-capped container			
Transport	Send to the Lab immediately			
Unacceptable	Contaminated with blood			
Method	Oxygen Depletion (Glucose Oxidase), Colorimetry			
TAT	STAT: 1 hour			
Clinical Usage	Assessment of CNS diseases and infection			
Reference Range	CSF Glucose	2.2 – 3.9	mmol/L	
	CSF Protein	0.15 – 0.45	g/L	
	CSF Lactate	1.1 – 2.4	mmol/L	

25. Ferritin		Clinical Chemistry (ext 224)	
Specimen	Blood (SSTII gold top, 3mL)		
Unacceptable	Haemolysed		
Method	Sandwich principle		
Performed	Daily		
TAT	1 day		
Clinical Usage	Screening test for iron status		
Reference Range	Male (20 – 60 years)	30 – 400	ng/mL
	Female (17 – 60 years)	13 – 150	ng/mL

26. Gamma-Glutamyl Transferase (GGT)				Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)			
Unacceptable	Haemolysed			
Method	Enzymatic, Colorimetric			
Performed	Daily			
TAT	Routine: 1 day, STAT: 1.5 hours			
Clinical Usage	Liver profile assessment			
Reference Range	Male	10 – 71	U/L	
	Female	5 – 36	U/L	

27. Gentamicin Level, Peak		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
	Collect 30 min after end of IV infusion, or 1 hr after IM injection	
Method	Kinetic Interaction of Microparticles in a solution (KIMS)	
Performed	Daily	
TAT	1 day, STAT: 1.5 hours	
Clinical Usage	Therapeutic drug monitoring	
Reference Range	6.0 – 10.0 mg/L	

28. Gentamicin Level, Trough		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
	Collect specimen immediately before next dose	
Method	Kinetic Interaction of Microparticles in a solution (KIMS)	
Performed	Daily	
TAT	1 day, STAT: 1.5 hours	
Clinical Usage	Therapeutic drug monitoring	
Reference Range	0.5 – 2.0 mg/L	

29. Glucose Tolerance Test (GTT)		Clinical Chemistry (ext 224)			
Specimen	Blood (grey top - 3mL). Fasting and 2 hours after glucose (75g) intake				
Unacceptable	Fasting less than 8 hours				
Method	UV Absorbance / Enzymatic with Hexokinase				
Performed	Daily				
TAT	1 day				
Clinical Usage	Diagnosis of diabetes mellitus				
Reference Range		Normal	Impaired	Diabetic	
	Fasting	< 6.1	6.1 – 6.9	> 7.0	mmol/L
	2 hours	< 7.8	7.8 – 11.0	> 11.1	mmol/L

30. Glucose, Fasting (FBS)		Clinical Chemistry (ext 224)
Specimen	Blood (grey top - 3mL preferred or SSTII gold top, 3mL).	
Unacceptable	Fasting less than 8 hours	
Method	UV Absorbance / Enzymatic with Hexokinase	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Diagnosis and monitoring of diabetes mellitus	
Reference Range	3.5 – 5.9 mmol/L	

31. Glucose, Post-prandial (2PPS)		Clinical Chemistry (ext 224)
Specimen	Blood (grey top - 3mL preferred or SSTII gold top, 3mL).	
Unacceptable	Time taken less than 2 hours	
Method	UV Absorbance / Enzymatic with Hexokinase	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Diagnosis and monitoring of diabetes mellitus	
Reference Range	4.0 – 7.7 mmol/L	

32. Glucose, Random (RBS)			Clinical Chemistry (ext 224)	
Specimen	Blood (grey top - 3mL preferred or SSTII gold top, 3mL).			
Method	UV Absorbance / Enzymatic with Hexokinase			
Performed	Daily			
TAT	Routine: 1 day, STAT: 1.5 hours			
Clinical Usage	Diagnosis and monitoring of diabetes mellitus			
Reference Range		Male	Female	
	1 week – 1 year	3.9 – 6.8	3.1 – 6.3	mmol/L
	Adult	4.0 – 7.7		mmol/L

33. Human Chorionic Gonadotropin (HCG), Beta Total		Clinical Chemistry (ext 224)	
Specimen	Blood (SSTII gold top, 3mL or heparin- green top, 4mL)		
Method	Sandwich Principle		
Performed	Daily		
TAT	Routine: 1 day, STAT: 1.5 hours		
Clinical Usage	Evaluation of pregnancy status		
Reference Range	Non – pregnant women premenopausal	<5.	IU/L
		3	
	Post-menopausal	<8.	IU/L
		3	

34. Iron		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Colorimetric	
Performed	Daily	
TAT	1 day	
Clinical Usage	Indicators of a wide range of dysfunctions including anemias, nephrosis, cirrhosis and hepatitis	
Reference Range	5.83 – 34.5 μmol/L	

35. Iron Studies		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Panel test: Iron, Transferrin	
Performed	Daily	
TAT	1 day	
Clinical Usage	Assessment of iron status	
Reference Range	Refer to individual analytes	

36. Lactate		Clinical Chemistry (ext 224)
Specimen	Blood (grey top - 2mL)	
	Draw blood without stasis to avoid spurious lactate elevation	
Transport	Specimen in ice, send to the Lab immediately	
Unacceptable	Delay longer than half an hour	
Method	Colorimetric	
Performed	Daily	
TAT	STAT: 1 hour	
Clinical Usage	Evaluation of metabolic and lactic acidosis	
Reference Range	0.5 – 2.2 mmol/L	

37. Lactate Dehydrogenase		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Hemolysed	
Method	Enzymatic Rate	
Performed	Daily	
TAT	STAT: 1.5 hours	
Clinical Usage	Diagnosis and treatment of liver diseases	
Reference Range	Male	135 - 225 IU/L
	Female	135 - 214 IU/L

38. Liver Function Test (LFT)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Panel test: ALP, ALT, Albumin, GGT, Total Bilirubin, Total Protein	
Performed	Daily	
TAT	Routine: 1 day, Stat: 1.5 hours	
Clinical Usage	Liver profile assessment	
Reference Range	Refer to individual analytes	

39. Magnesium		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Colorimetric	
Performed	Daily	
TAT	Routine: 1 day, Stat: 1.5 hours	
Clinical Usage	Assessment of several diseases and conditions including uremia, dehydration etc	
Reference Range	0.66 – 1.07 mmol/L	

40. Paracetamol (Acetaminophen)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Homogenous enzyme immunoassay	
TAT	STAT: 1.5 hours	
Clinical Usage	Diagnosis of paracetamol toxicity	
Reference Range	Therapeutic:	10 – 30 mg/L
	Hepatotoxic:	
	After 4 hours	> 200 mg/L
	After 8 hours	> 100 mg/L
	After 12 hours	> 50 mg/L

41. Phosphate (PO₄)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	UV Absorbance	
Performed	Daily	
TAT	1 day	
Clinical Usage	Assessment of calcium and phosphate disorders	
Reference Range	0.81 – 1.45 mmol/L	

42. pH, Fluid		Clinical Chemistry (ext 224)
Specimen	Fluid in screw-capped container	
Method	Potentiometry	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of pleural effusion	

43. Pleural Fluid Chemistry		Clinical Chemistry (ext 224)
Specimen	Fluid in screw-capped container. Send as a pair with serum sample.	
Method	Panel/Individual tests: Protein, Glucose	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of pleural effusion	

44. Potassium, Serum		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed, overnight	
Method	Indirect ISE	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Evaluation/assessment of electrolyte imbalance	
Reference Range	3.5 – 5.1 mmol/L	

45. Potassium, Urine		Clinical Chemistry (ext 224)
Specimen	Random urine, 20mL in sterile screw-capped container	
Method	Indirect ISE	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation/assessment of electrolyte imbalance	
Reference Range	25 – 125 mmol/24 hours	

46. Procalcitonin		Clinical Chemistry (ext 224)												
Specimen	Blood (SSTII gold top, 3mL)													
Method	Sandwich													
	Principle													
Performed	Daily													
TAT	1 day													
Clinical Usage	Risk assessment of critically ill patients for progression to severe sepsis and septic shock													
Reference Range	<table> <tr> <td><</td><td>ng/mL</td><td>Low risk of severe sepsis/septic shock</td></tr> <tr> <td>0.5</td><td></td><td></td></tr> <tr> <td>></td><td>ng/mL</td><td>High risk of severe sepsis and/or septic shock</td></tr> <tr> <td>2.0</td><td></td><td></td></tr> </table>		<	ng/mL	Low risk of severe sepsis/septic shock	0.5			>	ng/mL	High risk of severe sepsis and/or septic shock	2.0		
<	ng/mL	Low risk of severe sepsis/septic shock												
0.5														
>	ng/mL	High risk of severe sepsis and/or septic shock												
2.0														

47. Protein, Total (TP)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Colorimetri c	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Diagnosis and treatment of diseases of the liver, kidney, bone marrow and other metabolic and nutritional disorders.	
Reference Range	66 – 87 g/L	

48. Protein, Urine		Clinical Chemistry (ext 224)
Specimen	Random urine, 20mL in sterile screw-capped container or 24-hr Urine collection (Urine container, without preservative)	
Unacceptable	Collection instruction not followed	
Method	Colorimetric	
Performed	Daily	
TAT	1 day	
Clinical Usage	Indicator of renal impairment	
Reference Range	Random	< 0.15 g/L
	24 hours	< 0.14 g/24 h

49. Protein Creatinine Ratio (PCR)		Clinical Chemistry (ext 224)
Specimen	Random urine - 20mL in sterile screw-capped container, no preservative, preferred early morning urine specimen	
Method	Calculated from Urine Protein and Urine Creatinine	
Performed	Daily	
TAT	1 day	
Clinical Usage	Indicator of renal impairment	
Reference Range	Normal to mildly increased	< 15 mg/mmol
	Moderately increased	15 – 50 mg/mmol
	Proteinuria	> 50 mg/mmol

50. Renal Panel (RP1 & RP2)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed	
Method	Panel test: RP1: Urea, Electrolytes, Creatinine, CO ₂ , Chloride RP2: Calcium, Phosphate, Uric Acid	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Renal profile assessment	
Reference Range	Refer to individual analytes	

51. Sodium, Serum		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed, overnight	
Method	Indirect ISE	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Evaluation of fluid and electrolyte imbalance	
Reference Range	136 – 145 mmol/L	

52. Sodium, Urine		Clinical Chemistry (ext 224)
Specimen	Random urine, 20mL in sterile screw-capped container	
Method	Indirect ISE	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of fluid and electrolyte imbalance	
Reference Range	40 – 220 mmol/24 hours	

53. Thyroxine, Free (Free T4)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Electrochemiluminescence immunoassay (ECLIA)	
Performed	Daily	
TAT	1 day	
Clinical Usage	Diagnose hyperthyroidism and hypothyroidism	
Reference Range	Adult	2.0 – 3.6 pmol/L
	Neonatal 0 – 6 days	11 – 32 pmol/L
	al > 6 days – 3 months	11.5 – 28.3 pmol/L

54. Thyroid Stimulating Hormone (TSH)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Electrochemiluminescence immunoassay (ECLIA)	
Performed	Daily	
TAT	1 day	
Clinical Usage	Diagnose hyperthyroidism and hypothyroidism	
Reference Range	Adult	0.2700 – 4.200 uIU/mL
	Neonatal 0 – 6 days	0.7 – 15.2 uIU/mL
	> 6 days – 3 months	0.72 – 11.0 uIU/mL

55. Triiodothyronine, Free (Free T3)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Electrochemiluminescence immunoassay (ECLIA)	
Performed	Daily	
TAT	1 day	
Clinical Usage	Diagnose hyperthyroidism	
Reference Range	Adult 3.1 – 6.8 pmol/L	

56. Thyroid Function Test (TFT)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Electrochemiluminescence immunoassay (ECLIA)	
Performed	Daily	
TAT	1 day	
Clinical Usage	Thyroid profile assessment	
Reference Range	Refer to individual analytes	

57. Transferrin		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Immunoturbidimetric	
Performed	Daily	
TAT	1 day	
Clinical Usage	Aids in the diagnosis of malnutrition, acute inflammation, infection, assessment of renal function and red blood cell disorders, such as iron deficiency anemia.	
Reference Range	2.0 – 3.6 g/L	

58. Triglyceride		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Enzymatic Colorimetric	
Performed	Daily	
TAT	1 day	
Clinical Usage	Evaluation of lipid status	
Reference Range	Normal < 1.70 mmol/L	

59. Troponin T (High Sensitive)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Sandwich Principle	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Diagnosis of acute myocardial infarction	
Reference Range	< 14 ng/L	

60. Urea		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Method	Kinetic	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Assessment of renal function	
Reference Range	2.76 – 8.07 mmol/L	

61. Uric Acid (UA)		Clinical Chemistry (ext 224)
Specimen	Blood (SSTII gold top, 3mL)	
Unacceptable	Haemolysed, Lipaemic	
Method	Enzymatic Colorimetric	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1.5 hours	
Clinical Usage	Evaluation of uric acid metabolism	
Reference Range	Male 202 – 416 µmol/L	
	Female 142 – 214 µmol/L	

B) HAEMATOLOGY

1. Activated Partial Thromboplastin Time (APTT)		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top – up to the fill mark)	
Transport	Send to the Lab Immediately	
Unacceptable	Below or above the fill mark, haemolysed, clotted	
Method	Clotting	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Monitoring heparin therapy and screening test for bleeding disorders	
Reference Range	26.6 – 39.0 sec	

2. APTT 50% Correction		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the fill mark)	
Transport	Send to the Lab immediately	
Unacceptable	Below or above the fill mark, haemolysed and clotted	
Method	Clotting	
TAT	1 day	
Clinical Usage	To differentiate between coagulation factor deficiency and factor inhibitor	
Reference Range	26.6 – 39.0 sec	

3. D-Dimer		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the mark)	
Transport	Send to the Lab immediately	
Unacceptable	Below or above the level, haemolysed, clotted	
Method	Latex enhanced immunoturbidimetric	
Performed	Daily	
TAT	Routine: 1 day, STAT: 2 hours	
Clinical Usage	Aid in the diagnosis of disseminated intravascular coagulation (DIC), acute thromboembolic event	
Reference Range	0 – 255 ng/ml	

4. Differential Count		Haematology (ext 226)
Specimen	Blood (EDTA, purple top - 3mL)	
Unacceptable	Haemolysed, clotted	
Method	Fluorescence Flow Cytometry	
Performed	Daily	
TAT	Routine: 1 day, STAT: 30 minutes	
Reference Range	Refer to Lab Report	

5. Erythrocyte Sedimentation Rate (ESR)			Haematology (ext 226)	
Specimen	Blood (EDTA, purple top - 1mL)			
Unacceptable	Haemolysed, clotted			
Method	Infrared detection (photometry) correlated to Westergren method			
Performed	Daily			
TAT	Routine: 1 day			
Reference Range	Male	Female		
	< 50 years	< 15	< 20	mm/hr

6. Full Blood Count (FBC)		Haematology (ext 226)
Specimen	Blood (EDTA, purple top - 3mL)	
Unacceptable	Haemolysed, clotted	
Method	Flow Cytometry, Hydrodynamic Focusing Detection, Photometry	
Performed	Daily	
TAT	Routine: 1 day, STAT: 30 minutes	
Reference Range	Refer to Lab Report	

7. International Normalised Ratio (INR)		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the fill mark)	
Unacceptable	Below or above the fill mark, haemolysed, clotted	
Method	Calculated	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Monitoring of warfarin dosage	
Reference Range	0.8 – 1.2	

8. Malaria Parasite		Haematology (ext 226)
Specimen	Blood (EDTA, purple top - 3mL)	
Unacceptable	Haemolysed, clotted	
Method	Light microscopy, positive smears will be confirmed in Haematology Lab, RIPASH	
Performed	Daily	
TAT	Routine: 1 day, STAT: 4 hours	
Clinical Usage	Detection of malaria parasites	
Reference Range	No malaria parasite seen	

9. Platelet in Citrate		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the fill mark)	
Unacceptable	Below or above the fill mark, haemolysed, clotted	
Method	Hydrodynamic focusing	
Performed	Daily	
TAT	Routine: 1 day, STAT: 30 minutes	
Clinical Usage	Obtaining a more accurate platelet count when there is presence of platelet clumps due to EDTA	
Reference Range	174 – 430 x 10 ³ /μL	

10. Prothrombin Time (PT)		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the fill mark)	
Unacceptable	Below or above the fill mark, haemolysed, clotted	
Method	Clotting	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Screening test for bleeding disorders. Monitoring of anticoagulation therapy.	
Reference Range	9.5 – 11.9 sec	

11. Prothrombin Time (PT) 50% CORRECTION		Haematology (ext 226)
Specimen	Blood (Sodium Citrate, blue top - up to the fill mark)	
Unacceptable	Below or above the fill mark, haemolysed, clotted	
Method	Clotting	
Performed	Daily	
TAT	Routine: 1 day, STAT: 1 hour	
Clinical Usage	Screening test for bleeding disorders. Monitoring of anticoagulation therapy.	
Reference Range	9.5 – 11.9 sec	

12. Reticulocyte Count			Haematology (ext 226)		
Specimen	Blood (EDTA, purple top - 3mL)				
Unacceptable	Haemolysed, clotted				
Method	Fluorescence Flow Cytometry				
Performed	Daily				
TAT	Routine: 1 day, STAT: 30 minutes				
Clinical Usage	Assessment of erythropoietic activity				
Reference Range		%		Absolute	
	0 D – 1 month	2.3 – 5.4	%	0.12 – 0.40	10 ⁶ /μL
	1 – 6 months	0.7 – 1.1	%	0.02 – 0.06	10 ⁶ /μL
	6 months – 1 year	1.0 – 1.8	%	0.04 – 0.10	10 ⁶ /μL
	1 – 12 years	0.76 – 1.9	%	0.03 – 0.10	10 ⁶ /μL
	> 12 years	0.70 – 2.6	%	0.02 – 0.14	10 ⁶ /μL

13. Reticulocyte-Hemoglobin (Ret-He)		Haematology (ext 226)
Specimen	Blood (EDTA, purple top - 3mL)	
Unacceptable	Haemolysed, clotted	
Method	Fluorescence Flow Cytometry	
Performed	Daily	
TAT	Routine: 1 day, STAT: 30 minutes	
Clinical Usage	Assessment of erythropoietic activity	
Reference Range	25.8 – 38.2 pg	

C) BLOOD TRANSFUSION

1. ABO Group and Rh Type		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Immune agglutination or column agglutination technology	
TAT	Routine: 1 day, STAT: 2 hours	
Clinical Usage	Determination of ABO and Rh(D) blood group	

2. Antibody Screen (Red Cell)		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology	
TAT	Routine: 1 day, STAT: 2 hours	
Clinical Usage	Detect clinically significant alloantibodies	
Reference Range	Not Detected	

3. Crossmatch		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology or Haemagglutination	
Performed	Daily	
TAT	Routine: 1-3 days, STAT: 2 hours	
Clinical Usage	Compatibility for blood transfusion	

4. Cryoglobulin Screen		Blood Transfusion (ext 226)
Specimen	Blood (red top - 5mL), collect in a pre-warmed (37°C) tube	
Unacceptable	Haemolysed	
Method	Precipitation of cryoglobulin at 4°C	
Performed	By schedule. Contact laboratory for appointment.	
TAT	1 week	
Reference Range	Not Detected	

5. Direct Antiglobulin (Coombs) Test (DCT)		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Method	Column agglutination technology	
Performed	Daily	
TAT	Routine: 1 day, STAT: 2 hours	
Clinical Usage	To investigate the presence of globulins (IgG and C3d) coating red cells	
Reference Range	Negative	

6. Exchange Transfusion Compatibility Test		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top – 2mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology	
Performed	On request	
TAT	1 day	
Clinical Usage	Compatibility testing	

7. Emergency Blood		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology or Haemagglutination	
Performed	On request	
TAT	15 – 45 minutes	
Clinical Usage	Immediate availability of blood	

8. Fresh Frozen Plasma		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology	
Performed	On request	
TAT	2 hours	
Clinical Usage	Therapeutic Purpose	

9. Random and Single Donor Platelet		Blood Transfusion (ext 226)
Specimen	Blood (EDTA, purple/pink top - 3mL)	
Unacceptable	Haemolysed	
Method	Column agglutination technology	
Performed	On request	
TAT	1-2 days	
Clinical Usage	Therapeutic purpose	

D) MICROBIOLOGY

1. Culture and Sensitivity, Blood, Aerobic & Anaerobic

Microbiology (ext 225)

Specimen	8 to 10mL of blood into aerobic and anaerobic blood culture bottles. Do not refrigerate if there is delay in transport.
Method	Automated Microbial Growth Detection (fluorescence)
Performed	Daily
TAT	2 – 8 days
Clinical Usage	Diagnosis of septicaemia
Reference Range	No growth

2. Culture and Sensitivity, Blood, Paediatric

Microbiology (ext 225)

Specimen	1 to 3mL of blood into Peds Plus Bactec blood culture bottle. Do not refrigerate if there is delay in transport
Method	Automated Microbial Growth Detection (fluorescence)
Performed	Daily
TAT	2 – 8 days
Clinical Usage	Diagnosis of septicaemia
Reference Range	No growth

3. Culture and Sensitivity, Urine

Microbiology (ext 225)

Specimen	Urine (sterile screw-capped container), indicate MSU, catheterised or SPA
Unacceptable	Specimen more than 24 hours old
Method	Conventional culture
Performed	Daily
TAT	2 – 5 days
Clinical Usage	Diagnosis of urinary tract infection
Reference Range	No growth

4. Pregnancy Test, Urine

Microbiology (ext 225)

Specimen	Urine (sterile screw-capped container, 10mL), early morning specimen is preferred
Method	Immunochromatography
Performed	Daily
TAT	Routine: 1 day, STAT: 1 hour
Clinical Usage	Diagnosis of pregnancy and gestational trophoblastic diseases

5. Stool Microscopic Examination (Stool ME)

Microbiology (ext 225)

Specimen	Stool (sterile screw-capped container with attached spatula)
Unacceptable	Swab
Method	Light microscopy
Performed	Daily
TAT	2 days
Clinical Usage	Diagnosis of parasitic infections and cholera

6. Stool Occult Blood (SOB)

Microbiology (ext 225)

Specimen	Stool in sterile screw-capped container with attached spatula
Unacceptable	Specimens other than stool
Method	Immunochromatography
Performed	Daily
TAT	1 day
Clinical Usage	Detect the presence of blood in stool specimen
Reference Range	Negative

7. Urinalysis**Microbiology (ext 225)**

Specimen	Random urine (sterile screw-capped container, 10mL)
Transport	Send to the Lab as soon as possible
Method	Dipstick / microscopy
Performed	Daily
TAT	Routine: 1 day, STAT: 2 hours