



كمنتيرين كصحتين
KEMENTERIAN KESIHATAN
MINISTRY OF HEALTH



NATIONAL HAEMATOLOGY REFERENCE LABORATORY

Introduction

NHRL provide routine and specialized clinical haematological tests and interpretation of results. It has 6 sections under it including Automation section, Coagulation and Coagulation plus section, Bone Marrow Section, Morphology Section, Special Haematology and Malaria Section. Consultant haematologist worked closely with NHRL which provides interpretations of haematological results. NHRL operates 24-hour daily, therefore we worked by shift hours.

Our Services

Automation Section

Automation Section provides routine haematology testing including Full Blood Count, Differential Count, Retic Count and erythrocytes sedimentation rate.

Coagulation and Coagulation Plus Section

Coagulation Section provides routine tests including Prothrombin time, INR, Activated Partial Thromboplastin Time, Pro-thrombin time, thrombin, fibrinogen and D-dimer.

Coagulation Plus Section provides specialized tests including FVIII, FIX, Lupus anticoagulant, Protein C, Protein S, Antithrombin, Anti Xa and Rivaroxaban. They also process coagulation tests to be send oversea if needed.

Bone Marrow Section

Bone Marrow Section assists doctors especially Haematologist during bone marrow aspirate procedure whereby the lab officers prepare and make bone marrow aspirate slides to be reviewed and interpreted by Haematologist. They also ensure the bone marrow aspirate samples are sent for further testing including Immunophenotyping, cytogenetics test and molecular panel.

Morphology Section

Morphology Section works closely with Haematologist whereby it provides blood film review with interpretation. Other tests include Urine Haemosiderin. They also process Haematology specimen to be send oversea.



Special Haematology Section

Special Haematology Section provides Haemoglobinopathy screening including Thalassaemia diagnosis by Haematologist and other special appointment-based tests including Kleihauer tests, Osmotic Fragility and Sickling test.

Malaria Section

Malaria Section provides malaria screening and diagnosis of human malaria parasites including parasitaemia count. They work closely with Public Health in ensuring Brunei remain malaria free by doing mass screening on Brunei population and screening of all close contacts known to be infected with malaria.

This section is also responsible for mass screening of microfilaria conducted by Public Health when needed.

CONTACT US:

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☎ +673 2242424, ext 6045 (HOS), 6701 (Auto), 6701 (Coag), 6043 (BM/Morp), 6044 (Special)

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1. Activated Partial Thromboplastin Time (APTT)		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab Immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Daily		
TAT	2 hrs (STAT), 4 hrs (routine)		
Clinical Usage	Monitoring heparin therapy and screening test for clotting factors		
Reference	(Population range) 26.6 – 39.0 sec		

2. Apixaban		2242424 ext 6701		
Specimen	Blood (Sodium Citrate, blue top - up to the mark)			
Unacceptable	Below or above the mark, haemolysed, clotted			
Method	Automated Chromogenic Assay			
Performed	Daily			
TAT	4 hours			
Clinical Usage	To monitor the plasma concentration of Rivaroxaban			
Reference	(Journal Reference)			
	Dosage	Apixaban C-min (ng/mL) trough plasma concentration (predose)		Apixaban C-max (ng/mL) peak plasma concentration (2-4 hours postdose)
	Prevention of VTE: elective hip or knee replacement surgery			
	2.5 mg twice daily	51 (23-109)		77 (41-146)
	Prevention of stroke and systemic embolism: NVAf			
	2.5 mg twice daily	79 (34-162)		123 (69-221)
	5 mg twice daily	103 (41-230)		171 (91-321)
	Treatment of DVT, treatment of PE and prevention of recurrent DVT and PE (VTE)			

	2.5 mg twice daily	32 (11-90)	67 (30-153)	
	5 mg twice daily	63 (22-177)	132 (59-302)	
	10 mg twice daily	120 (41-335)	251 (111-572)	

3. Anti-Thrombin		2242424 ext 6701		
Specimen	Blood (Sodium Citrate, blue top – up to the mark)			
Unacceptable	Below or above the level, haemolysed, clotted			
Method	Automated Chromogenic assay			
Performed	Samples accepted daily, frozen and tested in a weekly basis			
TAT	2 weeks			
Clinical Usage	Investigation of inherited and acquired thrombotic tendency			
Reference	(Population range) 83 -131%			

4. Anti-Xa (Low Molecular Weight Heparin)		2242424 ext 6701		
Specimen	Blood (Sodium Citrate, blue top – up to the mark)			
Unacceptable	Below or above the level, haemolysed, clotted			
Method	Automated Chromogenic assay			
Performed	Daily			
TAT	4 hours			
Clinical Usage	To monitor low molecular weight heparin therapy			
Reference	(Journal Reference) Therapeutic range : 0.5 – 1.2 IU/mL			

5. APTT 50% Correction		2242424 ext 6701		
Specimen	Blood (Sodium Citrate, blue top - up to the mark)			
Transport	Send to the Lab immediately			
Unacceptable	Below or above the mark, haemolysed and clotted			
Method	Clotting			

Performed	Daily		
TAT	4 Hrs		
Clinical Usage	To detect the presence of inhibitors of coagulation		
Reference	(Population range) 26.6 – 39.0 sec		

6. Blood Film		2242424 ext 6701	
Specimen	Blood (EDTA, purple top – 1-2 mL)		
Transport	Send to the Lab Immediately		
Unacceptable	Haemolysed, clotted		
Method	Light microscopy		
Performed	Office hours only		
TAT	3 working day		
Clinical Usage	To interpret FBC result		

7. Bone Marrow Aspirate		2242424 ext 6043	
Specimen	Bone marrow aspirate		
Transport	Send to Lab Immediately		
Unacceptable	Dry tap		
Method	May-Grunwald Giemsa Stain, Perl's Stain		
Performed	Office hours		
TAT	14 working days		

8. D-Dimer		2242424 ext 6701	
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	Immunoturbidimetry		
Performed	Daily		
TAT	4 hrs		
Clinical Usage	Aid in the diagnosis of disseminated intravascular coagulation (DIC), acute thromboembolic event		

Reference	(Population range) 0 - 255 ng/mL D-Dimer Unit	
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9. Differential Count (Diff)		2242424 ext 6701	
Specimen	Blood (EDTA,purple top - 3mL)		
Transport	Send to the Lab immediately		
Unacceptable	Haemolysed, clotted		
Method	Light Microscopy or Light Scattering Flow Cytometry		
Performed	Daily		
TAT	1 Hr (STAT), 8 Hrs (routine)		
Reference	See Lab Report		

10. Erythrocyte Sedimentation Rate (ESR)		2242424 ext 6701	
Specimen	Blood (EDTA,purple top - 1mL)		
Unacceptable	Haemolysed, clotted		
Method	Photometric rheology/ Alcor Scientific iSED		
Performed	Daily		
TAT	1 day		
Reference	(Population range) Male Female	1 - 31 mm/hr 1 – 34 mm/hr	

11. Factor VIII assay		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Samples accepted daily, frozen and tested in a weekly basis		
TAT	2 weeks		
Clinical Usage	To determine the Factor VIII activity		
Reference	(Journal Reference) 50 – 150%		

12. Factor IX assay		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Samples accepted daily, frozen and tested in a weekly basis		
TAT	2 weeks		
Clinical Usage	To determine the Factor IX activity		
Reference	(Journal Reference) 65 – 150%		

13. Fibrinogen Level		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Daily		
TAT	4 Hrs		
Clinical Usage	Aids in the detection of fibrinogenaemia, disseminated intravascular coagulation and fibrinolysis		
Reference	(Population range) 1.8 – 4.2 g/L		

14. Full Blood Count (FBC)		2242424 ext 6701		
Specimen	Blood (EDTA, purple top - 3mL)			
Unacceptable	Haemolysed, clotted			
Method	Test includes machine operated differential count by light scattering flow cytometry, cytochemistry			
Performed	Daily			
TAT	1 hr (STAT), 8 Hrs (routine)			
Reference	(Population ranges for Male and Female)			
		Newborn	Male	Female
	WBC x 10 ⁹ /L	10.0 - 26.0	4.2 - 12.6	4.2 – 12.6
	RBC x 10 ¹² /L	5.0 - 7.0	4.67 - 6.13	4.00 – 5.62
	HB g/dL	14.0 - 22.0	13.5 - 17.9	11.5 – 15.9
	PCV %	44.0 - 75.0	41.6 - 53.6	35.8 – 49.0
	MCV fL	100 – 120	81.0 - 95.4	81.0 – 95.4

	MCH pg	31 - 37	26.0 - 31.6	26.0 – 31.6
	MCHC g/dL	30 – 36	30.4 - 34.8	30.4 – 34.8
	PLT x 10 ⁹ /L	100 – 450	174 – 430	174 – 430
	MPV x fL		8.5 – 11.7	8.5 – 11.7

15. Lupus Anticoagulant screen (LA)		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	dVVRT		
Performed	Samples accepted daily, frozen and tested in a weekly basis		
TAT	2 weeks		
Clinical Usage	Consider this test in prolonged APTT, recurrent abortions, SLE or thrombotic conditions		
Reference	Not detected		

16. Malarial Parasites		2242424 ext 6701		
Specimen	Blood (EDTA, purple top)			
Unacceptable	Haemolysed, clotted			
Method	Light microscopy			
Performed	Daily except Foreign worker only done during office hour			
TAT	4hr (STAT), 5 working days (Routine and Foreign Worker screening)			
Clinical Usage	Detection and identification of malarial parasites			

17. Osmotic Fragility (Red Cell)		2242424 ext 6044	
Specimen	Fresh blood (Lithium Heparin,green top - 4mL)		
Transport	Send to the Lab immediately		
Unacceptable	Haemolysed		
Method	Spectrometry		
Performed	Office hours only		
TAT	2 days		
Clinical Usage	Detection of the presence of red cell with membrane defects e.g. hereditary spherocytosis		

Reference	Increased osmotic fragility (shift to the right). Suggestive of Hereditary spherocytosis
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18. Prothrombin Time –INR (PT-INR)		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Daily		
TAT	2 Hrs, STAT		
Clinical Usage	Screening test for clotting disorders. Monitoring of anticoagulation therapy		
Reference	(Population range) PT: 9.5 – 11.9 sec INR: 0.9 – 1.1		

19. Protein C		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Chromogenic assay		
Performed	Samples accepted daily, frozen and tested in a weekly basis		
TAT	2 weeks		
Clinical Usage	Thrombophilia screening		
Reference	(Population range) 66 – 178%		

20. Protein S		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Automated latex ligand immunoassay		
Performed	Samples accepted daily, frozen and tested in a weekly basis		
TAT	2 weeks		
Clinical Usage	Thrombophilia screening		
Reference	(Population range) 42 - 122%		

21. PT 50% Correction		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Daily		
TAT	4 Hrs		
Clinical Usage	To detect presence of inhibitors of coagulation		

22. Reticulocyte Count		2242424 ext 6701		
Specimen	Blood (EDTA, purple top - 3mL)			
Unacceptable	Haemolysed, clotted			
Method	Light scattering flow cytometry, cytochemistry			
Performed	Daily			
TAT	1 Hrs (STAT), 8 Hrs (routine)			
Clinical Usage	Assessment of erythropoietic activity			
Reference	(Population range for 12 yrs. Dacie and Lewis Practical Haematology for less than 12 yrs)			
	Age	Retic (%)	Retic # (x 10 ⁶ /μL)	
	0-1 mth	2.3 – 5.4 %	0.12-0.4	
	1-6 mths	0.7-1.1 %	0.02-0.06	
	6 mths- 1 yr	1.0-1.8 %	0.04-0.1	
	1 yr-12 yrs	0.76-1.9 %	0.03-0.1	
	12 yrs	0.7-2.6 %	0.02-0.14	

23. Rivaroxaban		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Automated Chromogenic Assay		
Performed	Daily		
TAT	4 hours		
Clinical Usage	To monitor the plasma concentration of Rivaroxaban		
Reference	(Journal Reference)		
	<u>Rivaroxaban (Peak)</u>	<u>Rivaroxaban (Trough)</u>	
	For Dose : 10mg od Range : 91 – 195 ng/mL	For Dose : 10md od Range : 1 - 38 ng/mL	
	For Dose : 20md od Range : 160 -360 ng/mL	For dose : 20mg od Range : 4 – 96 ng/mL	

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24. Sickling Test		2242424 ext 6044	
Specimen	Blood (EDTA, purple top - 3mL), fresh		
Method	Sickle Scan, Reduction test (Sodium bisulphate)		
Performed	Office hours only		
TAT	1 day		
Clinical Usage	Detection of the presence of Hb S		
Reference	Negative		

25. Thalassaemia Screen or Hb Electrophoresis		2242424 ext 6044	
Specimen	Blood (EDTA, purple top - 3mL)		
Unacceptable	Clotted		
Method	HPLC, electrophoresis, Brilliant Cresyl Blue Stain		
Performed	Office hours only		
TAT	14 working days		
Clinical Usage	Investigation of thalassaemia and other haemoglobinopathies. Patient should not have blood transfusion in the last 3 months		
Reference	Test Hb A2 Hb F Hb C Hb S	1.8 – 3.5 % 0.1 – 1.4 % Absent Absent	

26. Thrombin Time		2242424 ext 6701	
Specimen	Blood (Sodium Citrate, blue top - up to the mark)		
Transport	Send to the Lab immediately		
Unacceptable	Below or above the mark, haemolysed, clotted		
Method	Clotting		
Performed	Daily		
TAT	4 Hrs		
Clinical Usage	Aids in the detection of presence of heparin, dysfibrinogenaemia, DIC		
Reference	(Population range) 11.6 – 17.2 sec		

27. Urine Haemosiderin			2242424 ext 6043
Specimen	Urine - 20mL, freshly taken		
Transport	Send to the Lab immediately		
Method	Perl's Prussian Blue		
Performed	Office hours only		
TAT	1 working day		