

Hematology

I. Hours of Operation:

Hematology: 24 Hours a day, 7 days a week

II. Contact Section:

Phone: 402-449-4898

III. Scope of Testing

A. HEMATOLOGIC TESTING:

1. Complete Blood Count (CBC) with 5-part automated differential – All white blood cell differentials are performed on the Sysmex automated hematology analyzers unless flagged. If flagged, the differential will be performed manually.
2. Reticulocyte count – Hemogram will also be performed for the RBC count.
3. Morphologic Review – Morphologic review of a peripheral blood smear is performed under three conditions
 - (a) Physician's request
 - (b) Flagged by Sysmex automated hematology analyzer
 - (c) QA review by technologists
4. Erythrocyte Sedimentation Rate
5. Body Fluid Cell Count – Morphologic review and cell count of pleural, peritoneal, pericardial, cerebrospinal, and joint fluids. Body fluid differentials will only be performed when WBC count is greater than 5.

B. COAGULATION AND THROMBOSIS TESTING:

1. Clotting times – Includes the following
 - (a) Prothrombin time (PT) and PT-INR
 - (b) Activated partial thromboplastin time (aPTT)
 - (c) Thrombin time (TT)
2. 50:50 mixing studies – PT mix and aPTT mix
3. Bleeding time (BT)
4. Coagulation factor assays – Includes the following
 - (a) Factor VIII
 - (b) Factor IX
 - (c) Factor XI
 - (d) Fibrinogen
5. von Willebrand Panel – Includes the following
 - (a) Factor VIII activity levels (FVIII-Ac)
 - (b) Von Willebrand antigen levels (vWF-Ag) – sendout test
 - (c) Ristocetin co-factor activity (Rcof) – sendout test
6. Thrombosis workup
 - (a) Activated protein C resistance (APCR) – sendout test
 - (b) Protein C level
 - (c) Protein S level
 - (d) Antithrombin III level
7. Heparin levels – Includes the following
 - (a) Unfractionated heparin
 - (b) Low molecular weight heparin (LMWH [Anti factor Xa assay])
8. D-Dimer levels
9. Fibrin/Fibrinogen degradation products (fdp/FDP)

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- C. HEMOGLOBIN / RED CELL TESTING
 1. Hemoglobin electrophoresis
 2. Sickle cell solubility test
 3. Kleihauer-Betke test

- D. ADDITIONAL SERVICES
 1. Neutrophil alkaline phosphatase (LAP score)
 2. A clinician may order a PATH REVIEW of any body fluid or blood smear and a pathologist will perform the review and issue a report.

IV. Specimen Collection Instructions

- A. Specimens for Coagulation Tests

In order to produce valid results for coagulation tests, specimen integrity is crucial and must be maintained. All specimens for coagulation must be drawn and handled in the following manner:

 1. Obtain venous blood by clean venipuncture. Avoid slow draws and/or traumatic venipunctures as either of these may result in an activated or clotted sample. Do not use needles smaller than 23 gauge.
 2. Fill the light blue tubes as far as vacuum will allow. An exact ratio of 9 parts blood to 1 part anticoagulant must be maintained. Mix by gentle inversion.
 3. We currently stock 2.7 mL sodium citrate tubes. We also have 1.8 mL sodium citrate tubes for neonatal draws. The proper amount of blood must be added to the tube to maintain the 9:1 ratio. Short draws, clotted specimens, or hemolyzed specimens are unacceptable for testing.
 4. Avoid central lines; peripheral veins should be used. Follow nursing policy for line blood draws.

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V. CBC Reference Values

	Units	0 min-2 days	2 days-1 wk	1wk-2wk	2wk-1mo	1mo-6mo
WBC	x10 ³ /mcL	9.0-32.0	9.4-21.00	5.0-15.0	5.0-15.0	5.0-15.0
RBC	x10 ⁶ /mcL	4.00-6.66	4.00-6.66	3.60-6.30	3.00-5.20	3.00-5.20
HGB	g/dL	15.0-22.0	13.0-21.0	13.0-21.0	11.0-19.5	10.0-14.0
HCT	%	45.0-65.0	40.0-65.0	40.0-65.0	32.0-60.0	30.0-40.0
MCV	fL	95-121	87-120	87-120	87-120	74-105
MCH	pg	27.0-33.5	27.0-33.5	27.0-33.5	27.0-33.5	27.0-33.5
MCHC	g/dL	32.2-36.5	32.2-36.5	32.2-36.5	32.2-36.5	32.2-36.5
RDW	%	11.0-14.7	11.0-14.7	11.0-14.7	11.0-14.7	11.0-14.7
PLT	x10 ³ /mcL	100-400	100-400	140-420	140-420	140-420
MPV	fL	8.9-12.5	8.9-12.5	8.9-12.5	8.9-12.5	8.9-12.5
NEUTRO,ABS	x10 ³ /mcL	3.6-25.0	3.8-16.4	1.4-9.2	1.4-9.2	1.4-9.2
LYMPH,ABS	x10 ³ /mcL	2.2-11.2	3.4-9.7	2.2-8.0	2.1-10.8	2.1-10.8
MONO,ABS	x10 ³ /mcL	0.2-2.6	0.2-1.7	0.2-1.7	0.2-1.7	0.2-1.7
EOS,ABS	x10 ³ /mcL	0.0-1.0	0.0-0.6	0.0-0.4	0.0-0.4	0.0-0.4
BASO,ABS	x10 ³ /mcL	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1

	Units	6mo-24mo	24mo-6yr	6yr-12yr	M12-150yr	F12-150yr
WBC	x10 ³ /mcL	5.0-13.5	4.5-12.0	4.5-12.0	3.6-10.3	3.6-10.3
RBC	x10 ⁶ /mcL	3.80-5.20	3.80-5.20	3.80-5.20	4.63-6.08	3.93-5.22
HGB	g/dL	10.0-14.0	11.5-15.0	11.5-15.0	13.7-17.5	11.2-15.7
HCT	%	30.0-40.0	35.0-45.0	35.0-45.0	40.1-51.0	34.1-44.9
MCV	fL	72-87	72-87	77-95	80.0-98.0	80.0-98.0
MCH	pg	27.0-33.5	27.0-33.5	27.0-33.5	25.0-34.0	25.0-34.0
MCHC	g/dL	32.2-36.5	32.2-36.5	32.2-36.5	31.0-36.5	31.0-36.5
RDW	%	11.0-14.7	11.0-14.7	11.0-14.7	11.0-16.3	11.0-16.3
PLT	x10 ³ /mcL	140-420	140-420	140-420	140-420	140-420
MPV	fL	8.9-12.5	8.9-12.5	8.9-12.5	8.9-12.5	8.9-12.5
NE,ABS	x10 ³ /mcL	1.0-6.2	1.3-6.7	1.5-8.2	1.7-7.3	1.7-7.3
LY,ABS	x10 ³ /mcL	2.1-9.7	1.6-7.8	1.1-5.4	0.5-3.0	0.5-3.0
MO,ABS	x10 ³ /mcL	0.2-1.5	0.1-1.3	0.1-1.3	0.2-1.0	0.2-1.0
EO,ABS	x10 ³ /mcL	0.0-0.4	0.0-0.4	0.0-0.4	0.0-0.8	0.0-0.8
BASO,ABS	x10 ³ /mcL	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1