

MINISTRY OF NATIONAL GUARD HEALTH AFFAIRS



DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE RECEIVING AND ACC LABORATORY



Laboratory Specimen Collection Guidelines



“Accurate and Precise Laboratory Data Depends on Properly Performed Phlebotomy to Obtain a High Quality Specimen”

FEBRUARY 2015

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1. INTRODUCTION

These guidelines are provided to ensure correct, error-free and safe blood collection. By understanding and following these instructions, you will be adhering to best practices and policies of the King Abdulaziz Medical City- Ministry of National Guard Health Affairs.

2. OBJECTIVES

- To provide an overview of Phlebotomy in general:
 - ❖ Patient Identification
 - ❖ Specimen Collection Policies
 - ❖ Blood Collection Procedures
 - ❖ Order of Draw
- To provide an overview on proper urine collection and storage.
- To provide a list of different tests available in the laboratory.
- To provide guidelines on the minimum volumes required, tube to be used and sample requirements for the different tests available in the laboratory.

3. ORDERING OF LABORATORY TESTS IN THE HOSPITAL INFORMATION SYSTEM (HIS)

Physicians are the one's ordering the laboratory tests of each patient in the Quadramed (QCPR). All the special areas (ICU's, ER, CCU, Liver Step-down, Pediatric Cardiac Step-down) which are **NURSE DRAW** should be entered as **NON-LAB COLLECT** while the regular wards in the hospital (WARDS 1-5, 12-16, 18-25, 29-30, 33-34, 36-16C) which are **LAB DRAW** should be entered as **LAB COLLECT**.

****All Laboratory specimens that are sent to the laboratory should have an entry in the computer system. All nurses should collect in the system all the ordered tests of the doctor before sending the samples to avoid delay in the processing of the samples.*

SAMPLES WITH ACCOMPANYING REQUISITION FORMS

3.1 Specimens to be analyzed for the following test should have an accompanied requisition form:

3.1.1 All referred tests

**NOTE: List of tests sent to other laboratories is available on the Online Help System in the intranet.*

3.1.2 Molecular laboratory test

3.1.2.1 **Genetic disease tests**

3.1.2.2 **DNA banking**

**NOTE: DNA banking and Genetic tests should be accompanied by a consent form signed by the patient or the patient's immediate relative and the requesting Physician.*

3.1.3 Virology tests

3.1.3.1 **CMV PP65**

3.1.3.2 **PCR and viral load test**

3.1.4 Blood bank tests

3.1.4.1 **Type and screen**

3.1.4.2 **Transfusion reaction**

3.1.4.3 **Cord blood typing**

3.1.4.4 **ABO Rh typing**

3.1.4.5 **DAT blank test**

3.1.5 Serology tests

3.1.5.1 **Allergy test**

3.1.5.2 **Aspergillus test**

3.1.6 Cytogenetic tests

3.1.6.1 **Chromosomal analysis**

3.1.6.2 **Amniotic fluid analysis**

3.1.7 All **HLA** and **Flowcytometry** tests

3.1.8 All **Histopathology** and **Cytology** tests

NOTE: appropriate clinical date is mandatory for the following section of the Laboratory - Cytology, Histology, Molecular, Metabolic Laboratory and Referral-Send out.

4. PATIENT IDENTIFICATION

**NOTE: All patients must be positively identified before the specimen collection is performed.*

4.3.1 For **Inpatients:**

4.3.1.1 The two patient identifiers must be present (*patient's name and patient's medical record number*) on the patient's wrist band.

4.3.1.2 The patient's room and bed number may not be used as an identifier.

4.3.1.3 While checking the wrist band, ask the patient to state his/her full name or if not possible, the relative of the patient.

4.3.1.4 The patient's wrist band must match exactly the full name and the medical record number of the patient on the requisition forms and all specimen labels.

4.3.2 For **Outpatient:**

4.3.2.1 While checking the hospital medical card, appointment slip or Saudi ID and the laboratory requisition form, ask the patient to state his/her full name or if not possible, the relative of the patient.

4.3.2.2 The patient's medical record card, appointment slip or Saudi ID must match exactly the full name and the medical record number of the patient on the requisition forms and all specimen labels.

4.3.3 **Patient Identification for Blood Bank Compatibility Testing**

4.3.3.1 For **Inpatients:**

4.3.3.1.1 The patient identification and sample collection should be witnessed by a nurse and the badge numbers of the phlebotomist and the nurse must be documented on the Blood and Blood Components Requisition Form.

4.3.3.2 For **Outpatients:**

4.3.3.2.1 The patient identification and sample collection should be witnessed by another phlebotomist or the team leader and their badge numbers must be documented on the Blood and Blood Components Requisition Form.

4.3.3.3 For **Clinic 101** patients:

4.3.3.3.1 The patient identification and sample collection should be witnessed by a nurse and the badge numbers of the phlebotomist and the nurse must be documented on the Blood and Blood Components Requisition Form.

5. PATIENT PREPARATION

- The phlebotomist should ask the patient if there is any preparation observed before undergoing a specific laboratory test such as fasting, diet restrictions and avoidance of certain

activities (smoking, strenuous exercise, etc.) that may compromise the result.

***NOTE:** *Fasting for blood sugar test should be 8 to 10 hours while lipid test should be 10 to 12 hours.*

- The phlebotomist should ask the patient for any allergy to latex supplies or iodine disinfectants which will be used during the sample collection.

***NOTE:** *Use non-latex tourniquet and gloves to patients with allergy to latex. Use Chlorhexidine swabs as disinfectants for patients with allergy to iodine for blood culture collection.*

- Patients should be clearly informed about the proper collection of 24 hour urine samples. Improperly collected samples yield inaccurate results.
- Instruct the patient to maintain usual amount of liquid intake.
- During the collection inform the patient that the urine container must be placed in a cool environment or in the refrigerator if possible, to prevent growth of microorganisms and possible decomposition of urine constituents.
- There are a number of foods to be avoided prior to collection of 24 hour urine samples depending on which laboratory test to analyze.

***NOTE:** *See table below.*

TEST NAME	PATIENT PREPARATION
CATECHOLAMINES	Avoid coffee, tea, banana, chocolate, cocoa, citrus fruits and vanilla for two days before the sample collection. If clinical condition allows, it is also recommended that the patient stops taking epinephrine, norepinephrine, dopamine, MAO-inhibitors or catecholamine-reuptake inhibitors at least two days prior to sampling.
Metanephrine	
Normetanephrine	
Vanillylmandelic acid (VMA)	
5-Hydroxy Indoleacetic acid (5-HIAA)	
CALCIUM	Avoid alcoholic beverages and the patient should be on a regular diet.
MAGNESIUM	Avoid alcoholic beverages and the patient should be on a regular diet.
PHOSPHATE	Avoid alcoholic beverages and the patient should be on a regular diet.
CREATININE	Avoid alcoholic beverages and the patient should be on a regular diet.
OXALATE	Avoid coffee, tea, vitamin C, spinach, chocolate and rhubarb for at least 48 hours

	before the sample collection.
SODIUM	Avoid alcoholic beverages and the patient should be on a regular diet.
POTASSIUM	Avoid alcoholic beverages and the patient should be on a regular diet.
CHLORIDE	Avoid alcoholic beverages and the patient should be on a regular diet.
PROTEIN	Avoid alcoholic beverages and the patient should be on a regular diet.
COPPER	Avoid alcoholic beverages and the patient should be on a regular diet.

5.1 Reassuring the patient

5.1.1 Explain clearly and courteously the procedure to the patient.

5.1.1.1 If the patient is a child, talk softly and calmly. It is important to keep the child at ease and comfortable.

5.1.2 If the patient refuses to continue the procedure, **DO NOT PROCEED** and immediately:

5.1.2.1 Inform the nurse in-charge of the patient (for inpatients) and ask for his/her badge number. Do documentation on the communication logbook.

5.1.2.2 Indicate on the requisition form that the procedure was discontinued (for outpatients).

5.1.2.3 Cancel the requested test in the system by using the “*patient refused*” cancellation code and place a comment with the badge number of the nurse in-charge of the patient or the person informed.

5.2 Proper positioning of the patient

5.2.1 Patients should lie in bed or sit in a comfortable position. Extend the arm so as to form a straight line from the shoulder to

6.2 EVACUATED METHOD – close system



Figure-2

1. RED TOP *without* GEL (for flushing)
2. COAGULATION (CITRATED)
3. SERUM (SST)
4. HEPARIN
5. EDTA
6. NAF
7. ACD
8. TRACE METAL

7. TYPES OF CONTAINERS

COLLECTION TUBE	ANTICOAGULANT & VOLUME	DETERMINATIONS	INVERSIONS
GREEN, YELLOW, PURPLE 	<u>AEROBIC</u> 30ml peptone-enriched TSB supplemented with BHI solids and activated charcoal/Blood or SBF <u>PEDIATRIC</u> 20ml peptone-enriched TSB, supplemented with BHI solids and activated charcoal/Blood <u>ANAEROBIC</u> 40ml TSB Blood or SBF	AEROBIC FOLLOWED BY ANAEROBIC	8-10 TIMES
LIGHT BLUE 	SODIUM CITRATE 0.109M	FOR COAGULATION DETERMINATIONS	3-4 TIMES
RED 	SERUM NONE	25-OH VITAMIN D – without gel separator	5-6 TIMES
GOLD 	SST NONE	FOR SERUM DETERMINATIONS IN CHEMISTRY – with gel separator	5-6 TIMES
GREEN 	SODIUM HEPARIN 68 I.U.	AMMONIA	8-10 TIMES
GREEN 	LITHIUM HEPARIN 68 I.U.	AMINO ACID DETERMINATIONS	8-10 TIMES
LAVENDER 	EDTA 7.2 mg	FOR WHOLE BLOOD HEMATOLOGY DETERMINATIONS	8-10 TIMES
LAVENDER 	K2E (EDTA) 10.8mg	CROSSMATCH TUBES FOR BLOOD TRANSFUSION PATIENTS	8-10 TIMES





<p>GREY</p> 	<p>SODIUM FLUORIDE 6.0mg Na₂EDTA 12.0mg</p>	<p>FOR GLUCOSE DETERMINATIONS; LACTIC ACID</p>	<p>8-10 TIMES</p>
<p>ACD</p> 	<p>ACID CITRATE DEXTROSE 1.5 ml</p>	<p>HLA SAMPLES</p>	<p>8-10 TIMES</p>
<p>ROYAL BLUE</p> 	<p>TRACE ELEMENT NONE</p>	<p>FOR TRACE ELEMENT, TOXICOLOGY AND NUTRIENT DETERMINATIONS</p>	<p>8-10 TIMES</p>
<p>QUANTIFERON TB</p> 	<p>NIL ANTIGEN TB ANTIGEN MITOGEN</p>	<p>FOR QUALITATIVE DETERMINATION OF TB</p>	<p>8-10 TIMES</p>

Table-1

8. SPECIMEN COLLECTION POLICIES

8.1 Avoid drawing blood from the following sites:

8.1.1 Arm with a running IV fluid

8.1.2 Arm with a shunt or graft

8.1.3 Edematous Arm

8.1.4 Arm with Hematoma

8.1.5 Femoral and Jugular veins

8.1.6 Artery

8.2 Do not draw blood from patients who refuse.

8.2.1 Phlebotomist or nurse can draw from a patient maximum of **TWO** times.

8.3 Phlebotomist or nurse may draw patients from an on-going blood transfusion if the doctor/nurse insists due to a necessary blood test. In this case, get the badge number of the doctor and the nurse in-charge. Inform also the Receiving Supervisor and the Section that the blood was taken during the blood transfusion or just indicate in the barcode label.

8.4 All Phlebotomist are only allowed to draw blood from Hardstick patients in the special areas of the hospital (e. g. ICU's, ER, CCU, Liver Stepdown, Pediatric Cardiac Stepdown)

AS PER APP: All Employees are not allowed to arrange their own blood extractions. They should go to Ambulatory Care Center (ACC) to have their blood draw with the valid hospital card and request form from the Employee Health Clinic or from the other clinics.

9. PREPARATION OF PHLEBOTOMY SUPPLIES

- 9.1 Non-sterile gloves
- 9.2 Chlorhexidine Gluconate scrub or Povidone Prep (2 months old), for blood culture collection.
- 9.3 Alcohol Prep pad
- 9.4 Gauze
- 9.5 Disposable Tourniquet
- 9.6 Evacuated collection tubes
- 9.7 Evacuated tube holder
- 9.8 Band aids, tapes or pressure bandages

10. SAFETY PRECAUTIONS AND INFECTION CONTROL PRACTICES

- 10.1 **Treat all samples as potentially infectious**
- 10.2 **Perform hand hygiene (hand washing or using hand sanitizer) before and after patient contact.**
- 10.3 **Change gloves between each patient.**
- 10.4 **Discard the disposable tourniquet after each blood collection.**
- 10.5 **Never take venipuncture trays inside the isolation rooms.**
- 10.6 **Do not use latex gloves and tourniquets to patients with allergy to latex.**

11. BLOOD COLLECTION PROCEDURE

11.1 Perform Hand Hygiene (Figure-1) & (Figure-2).



Figure-1



Figure-2

11.2 Put on gloves (Figure-3).



Figure-3

11.3 Apply tourniquet 3-4 inches above venipuncture site (Figure-4).
* Never leave the tourniquet longer than 1 minute.



Figure-4

11.4 Select the vein site (Figure-5).

* The median cubital vein is used most frequently

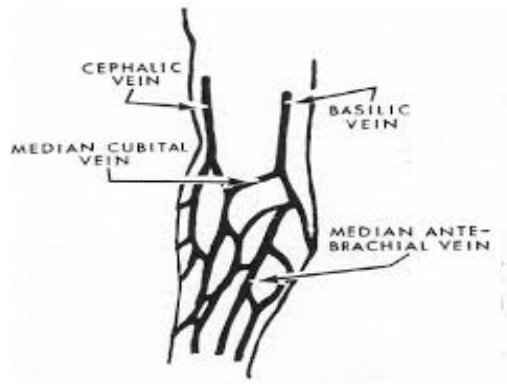


Figure-5

11.5 Using index finger, palpate for vein.

11.6 Clean the venipuncture site with 70% alcohol or povidone iodine swab if there is blood culture (Figure-6).



Figure-6

11.7 Perform venipuncture (Figure-7).



Figure-7

11.8 Thread needle into the adaptor until it is secure

11.9 Hold needle with bevel up at approximately 30° angle to skin in direct line with vein

11.10 Insert needle into vein with smooth motion

11.11 Push collection tube into holder (Figure-8).



Figure-8

11.12 Remove tube as soon as blood flow stops, gently invert 5-10 times to mix additive (always remove the last tube prior to withdrawing the needle from the vein)

11.13 Release tourniquet (Figure-9).



Figure-9

11.14 Place clean gauze over venipuncture site and remove needle gently (Figure-10).

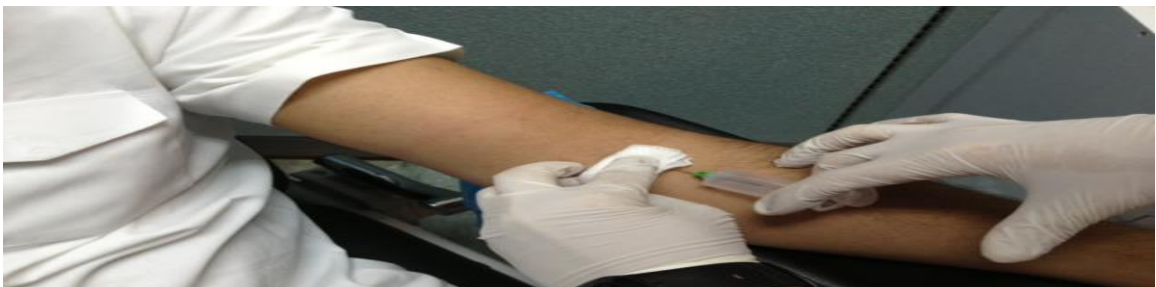


Figure-10

11.15 Place a tape over the gauze and apply pressure to stop the bleeding (Figure-11).



Figure-11

12. SPECIAL HANDLING OF SPECIMEN BETWEEN TIME OF COLLECTION AND TIME RECEIVED BY THE LABORATORY

12.1 C PP65 (CMV ANTIGENEMIA)

- 2 EDTA tubes with request form

Cut-Off Time: 11:00 AM

12.2 TBQ (QUANTIFERON TB)

- 3 special TBQ tubes (1 ml each) with request form

Cut-Off Time: 1500h/03:00 PM

12.3 AMMONIA, PTH, LACTIC ACID, PYRUVATE, METHANOL, RIBAVIRIN and BCR-ABL

- should be transported and placed immediately on ice after collection

12.4 RBC FOLATE, SERUM FOLATE, VITAMIN A and VITAMIN E

- should be covered with foil and protected from light immediately after collection

12.5 ALCOHOL and ETHANOL

- Collection tubes should not be opened and transported immediately after collection

12.6 PLATELET AGGREGATION STUDY AND PLATELET FUNCTION ASSAY

- Should be transported and placed immediately on a cup of warm water (37°C) or wrapped with a warmer.
- Should be incubated at 37°C in a water bath for 1 hour before centrifugation

12.7 BLOOD ANALYSIS THAT REQUIRES EXACT TIME OF COLLECTION

12.7.1 THERAPEUTIC DRUGS (VANCOMYCIN, AMIKACIN, GENTAMYCIN)

- TROUGH – should be drawn within 30 minutes prior to next dose
- PEAK – should be drawn 30 minutes after the end of infusion

12.7.2 Coagulation tests such as PT/PTT

12.7.3 Synactin stimulation for CORTISOL and ACTH

12.7.4 First hour, second hour and third hour sample for GLUCOSE TOLERANCE TESTS and POST-PRANDIAL BLOOD SUGARS

12.7.5 Other drugs such as TACROLIMUS, CYCLOSPORIN and SIROLIMUS

12.7.6 INSULIN and GROWTH HORMONE stimulation

12.7.7 Hormonal testing cycle

13. PROPER SPECIMEN LABELING

13.1 All primary specimen containers should be labeled on the patient's bedside right after the collection with two identifiers (medical record number and patient's name) together with the badge number of the person who collected the sample and the date and time of collection.

***NOTE:** *The patient's location (room and bed number) is not an acceptable identifier.*

13.2 Specimen containers should be labeled with a barcode. The identifying label should be attached to the specimen container(s) immediately after collection, and should not be deferred until a later time.

13.2.1 The barcode labels should include the following information:

- 13.2.1.1** Patient's full name
- 13.2.1.2** Patient's medical record number
- 13.2.1.3** Requesting location or ward
- 13.2.1.4** Patient's date of birth, age and gender
- 13.2.1.5** Collection date and time

- 13.2.1.6 Collection priority status
- 13.2.1.7 Sample's accession number
- 13.2.1.8 Test name

13.3 Check the name on each label to verify again that the name on the tube matches the barcode label.

13.4 The badge number of the person labeling the sample should be written on the barcode label.

13.5 Labeling of samples for Blood bank Compatibility Testing

13.5.1 The specimen container should be labeled handwritten on the patient's bedside right after the collection with two identifiers (medical record number and patient's full name) together with the badge number of the person who collected the sample and the date and time of collection.

13.5.2 A barcode label containing the same patient information with the badge number of the person labeling the sample is then affixed to the specimen container.

13.5.3 Cord blood samples submitted to the laboratory should be labeled with an addressograph on the patient's bedside right after the collection containing the two identifiers (medical record number and patient's name) together with the mother's medical record number and name, badge number of the person who collected the sample and the date and time of collection.

13.6 Labeling of samples for HLA Compatibility testing

13.6.1 The specimen container should be labeled handwritten on the patient's bedside right after the collection with two identifiers (medical record number and the patient's three names) together with the badge number of the person who collected the sample and the date and time of collection.

13.6.2 A barcode label containing the same patient information with the badge number of the person labeling the sample is then affixed to the specimen container.

14. SAMPLE TRANSPORTATION

There are **TWO** ways of sample transportation in the hospital:

- ❖ Handheld
- ❖ Pneumatic System

WHAT ARE THE SAMPLES THAT CAN BE SENT THRU THE CAPSULE (PNEUMATIC SYSTEM)?

14.1 The following are laboratory specimens that **CAN** be sent via the pneumatic tube system:

14.1.1 Blood specimens in evacuated containers

14.1.2 Urine and stool specimens in small plastic containers

14.1.3 All culture swabs for Microbiology

14.1.4 Blood culture bottles

14.2 The following are laboratory specimens that **CANNOT** be sent via the pneumatic tube system:

14.2.1 H1N1 swabs and other highly infectious samples

14.2.2 Blood specimens for TYPE and SCREEN (ABORH), DAT
BLANK and TRANSFUSION REACTION

14.2.3 Histopathology samples

14.2.4 Pap's smear

14.2.5 Body Fluids (CSF, Ascitic, Pleural, Peritoneal, Synovial)

14.2.6 MERS-COV samples (swab, sputum, tracheal aspirate, blood)

14.2.7 Blood samples for platelet aggregation and platelet function test

15. REASONS FOR SPECIMEN REJECTION

15.1 Unlabeled specimens

15.2 Mislabeled specimens

15.3 Clotted sample

15.4 QNS (Quantity not sufficient)

15.5 Wrong transportation (ex. not transported with ice)

15.6 Spilled sample

15.7 Wrong sample

15.8 Wrong tube/container

15.9 Improperly filled request form

Note: All submitted request form should be properly filled up by the nurses/physicians. It should contain the following:

15.9.1 Physicians badge and beeper number

15.9.2 Date and Time of collection

15.9.3 Collector's Badge number

15.9.4 Diagnosis

15.9.5 Type of Specimen

16. IRRETRIEVABLE SAMPLES

These are samples that are **difficult to re-collect**, hence should be taken carefully before sending to the laboratory.

1. BODY FLUIDS (CSF, ASCITIC, PLEURAL, SYNOVIAL, PERITONEAL, etc.)
2. HISTOPATHOLOGY SAMPLES (TISSUES)
3. PAP'S SMEAR
4. CORD BLOOD

A **Corrective Sample Form** (for **IRRETRIEVABLE** samples) should be filled in by the nurse-in-charge before re-labeling any unlabeled or mislabeled irretrievable samples.

17. BODY FLUIDS

Body Fluids are **pleural, pericardial, ascitic, peritoneal** cavities and **synovial** joints. Samples are obtained by **authorized physician** of the patient.

COLLECTION CONTAINERS:

- ❖ Sterile containers or sterile plain tubes for CSF and other fluid examinations except synovial fluid cell count.
- ❖ Synovial fluids for cell count should be anticoagulated in **EDTA** tube or **HEPARIN** tube.

NOTE: In order to avoid delaying the process and/ or contaminating the specimens please submit 3 separate samples containing 2-3ml of each fluid.

18. HISTOPATHOLOGY AND CYTOLOGY SAMPLES

• REQUIRED LABORATORY REQUISITION FORMS

18.1 Surgical Pathology Request Form

18.1.1 Fresh tissue samples for frozen sections

18.1.2 Tissue samples for biopsy

18.2 Non-Gynecological Cytology Request Form

18.2.1 Fluid cytology

18.3 Gynecological Cytology Request Form

18.3.1 Pap smear

• COLLECTION OF SPECIMENS

18.4 Samples are obtained by **authorized physician** of the patient.

18.5 Specimens collected from multiple sites should be collected in separate vials/slides with the specimen source identified.

• COLLECTION CONTAINERS

18.6 Fluid samples for non-gynecological cytology are collected in sterile containers.

18.7 Gynecological samples are collected in Pap smear containers with prepared fixatives.

18.8 Fresh tissue samples for frozen sections are collected in a sterile container.

18.9 Tissue samples for biopsy are collected in sterile containers with prepared concentration of formalin.

• SPECIMEN LABELING GUIDELINES

18.10 Specimen containers should be labeled immediately after collection with the two identifiers (medical record number and patient's name) together with the badge number of the physician who collected the sample, date and time of collection and the type of specimen collected

All samples for Histopathology and Cytology must be submitted directly to the **reception area** of Histopathology and Cytology during working hours **0800-1700 weekdays (Sunday- Thursday)**. After 1700 and during weekends (Friday – Saturday), samples must be submitted to the Receiving Laboratory.

19. SAMPLE INTEGRITY

19.1 PROTHROMBIN TIME (PT)

Container must remain closed at room temperature until test is performed. Test must be performed within 4 hrs after collection.

19.2 PARTIAL THROMBOPLASTIN TIME/ACTIVATED THROMBOPLASTIN TIME (PT/PTT)

Test must be performed within 2hrs after collection

19.3 COMPLETE BLOOD COUNT (CBC)

Samples are refrigerated for 7 days

19.4 URINALYSIS

Specimen should be delivered to the lab within 1hr from collection. It is a CAP requirement that urinalysis be performed within 2 hrs of collection.

20. SPECIMEN COLLECTION PRIORITIES AND TURN AROUND TIME:

Define as the time delay reasonably expected from the time of collection of the specimen to the time when the final results are available.

- ❖ **STAT** – approximately 1 hr
- ❖ **EXPEDITE** – approximately 2 hrs
- ❖ **ROUTINE** – approximately 6-8 hrs

21. URINE COLLECTION

21.1 RANDOM URINE: Midstream Clean-catch urine

21.2 24 HOUR URINE:

21.2.1 It is advisable to start the collection early morning

21.2.2 Patients must be informed and be provided with a written proper collection procedure for 24hr urine.

21.2.3 Instruct the patient to maintain usual amount of liquid intake and avoid alcoholic beverage

21.2.4 During collection, inform the patient that the urine container must be placed in a cool environment or in the refrigerator to prevent growth of microorganisms and possible decomposition of urine constituents

21.2.5 In the morning, the patient must empty his/her bladder into the toilet (whether or not he/she feel the need). The first time he/she urinate, urine must NOT be collected and saved. Fill in the start date and time on the bottle.

21.2.6 Every time the patient urinate thereafter should be collected and transferred into the storage container

21.2.7 Each time the patient urinates; urine must be collected and transferred to the 24hr urine container then return to the refrigerator or in its cold storage place.

21.2.8 Precisely 24hrs after starting the urine-collection test, patient should urinate one more time.

21.2.9 The last collected urine must be transferred into the storage container.

22. LIST OF URINARY TESTS PERFORMED IN THE LABORATORY:

**NO PRESERVATIVE REQUIRED*

**KEEP COLD DURING COLLECTION*

22.1 ACETONE – 10 ml random

22.2 AMYLASE – 10 ml random

22.3 ALBUMIN (MICROALBUMIN) – 10 ml random

22.4 AMINO ACID – 10 ml random (send-out)

22.5 BENICE JONES PROTEIN – 10 ml random or 24hr

22.6 CALCIUM – 5 ml random or 24hr

22.7 CREATININE – 5 ml random or 24hr

22.8 COPPER – 24hr (send-out)

22.9 CORTISOL – 24hr (send-out)

22.10 DRUG SCREEN (TOXSCREEN) – 10 ml random

22.11 5-HIAA – 10 ml random or 24hr

22.12 METANEPHRINES – 24hr

22.13 MUCOPOLYSACCHARIDE SCREEN – 10ml random (send-out)

22.14 MYOGLOBIN – 10ml random (send-out)

- 22.15 OSMOLALITY – 5 ml random
- 22.16 OXALATE – 24hr
- 22.17 PHORPHOBILINOGEN – 24hr (send-out)
- 22.18 PORPHYRINS – 24hr (send-out)
- 22.19 PHOSPHORUS - 5 ml random or 24hr
- 22.20 POTASSIUM – 5 ml random or 24hr
- 22.21 PROTEIN – 5 ml random or 24hr
- 22.22 PROTEIN ELECTROPHORESIS – 5 ml random or 24hr
- 22.23 REDUCING SUBSTANCES – 5 ml random
- 22.24 SODIUM – 10ml random or 24hr
- 22.25 UREA NITROGEN – 10 ml random or 24hr
- 22.26 URIC ACID – 5 ml random or 24hr
- 22.27 VANILYL MANDELIC ACID – 24hr

23. LABORATORY TEST LIST

23.1 (IN-HOUSE TESTS)

Table 1

CHEMISTRY SECTION				
NO.	TEST	MINIMUM VOLUME	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	A-1-ANTITRYPSIN	3 ml	SST (yellow)	SERUM
2	ACETAMINOPHEN	3 ml	SST (yellow)	SERUM
3	ALANINE AMINOTRANSFERASE (ALT)	3 ml	SST (yellow)	SERUM
4	ALBUMIN	3 ml	SST (yellow)	SERUM
5	ALKALINE PHOSPHATASE	3 ml	SST (yellow)	SERUM
6	AMIKACIN** <u>TROUGH</u> – drawn within 30 minutes prior to next dose <u>PEAK</u> – drawn 30 minutes after the end of infusion	3 ml	SST (yellow)	SERUM
7	AMMONIA *	3 ml	NaH (green)	PLASMA
8	AMYLASE (S)	3 ml	SST (yellow)	SERUM
9	AMYLASE (U)	3 ml		URINE
10	AMPHETAMINE/METHAMPETAMINE	3 ml	SST (yellow)	SERUM
11	ASPARTATE AMINOTRANSFERASE (AST)	3 ml	SST (yellow)	SERUM
12	B2-MICROGLOBULIN	3 ml	SST (yellow)	SERUM
13	BARBITURATES	3 ml	SST (yellow)	SERUM
14	BENZODIAZEPINES	3 ml	SST (yellow)	SERUM
15	BILE ACIDS, TOTAL	3 ml	SST (yellow)	SERUM
16	BILIRUBIN, DIRECT	3 ml	SST (yellow)	SERUM

17	BILIRUBIN, NEONATAL	3 ml	SST (yellow)	SERUM
18	BILIRUBIN, TOTAL	3 ml	SST (yellow)	SERUM
19	CALCIUM (S)	3 ml	SST (yellow)	SERUM
20	CALCIUM (U)	3 ml		URINE
21	CANNABINIODS	3 ml	SST (yellow)	SERUM
22	CARBAMAZEPINE (TEGRETOL)	3 ml	SST (yellow)	SERUM
23	CARBON DIOXIDE	3 ml	SST (yellow)	SERUM
24	CERULOPLASMIN	3 ml	SST (yellow)	SERUM
25	CHLORIDE (S)	3 ml	SST (yellow)	SERUM
26	CHLORIDE (U)	3 ml		URINE
27	CHOLESTEROL	3 ml	SST (yellow)	SERUM
28	COCAINE	3 ml	SST (yellow)	SERUM
29	COMPLEMENT 3	3 ml	SST (yellow)	SERUM
30	COMPLEMENT 4	3 ml	SST (yellow)	SERUM
31	CREATINE KINASE	3 ml	SST (yellow)	SERUM
32	CREATININE (S)	3 ml	SST (yellow)	SERUM
33	CREATININE (U)	3 ml		URINE
34	CYCLOSPORIN	3 ml	EDTA (purple)	PLASMA
35	DIGOXIN	3 ml	SST (yellow)	SERUM
36	ETHANOL	3 ml	SST (yellow)	SERUM
37	GAMMA GLUTAMYL TRANSFERASE (GGT)	3 ml	SST (yellow)	SERUM
38	GENTAMYCIN** <u>TROUGH</u> – drawn within 30 minutes prior to next dose <u>PEAK</u> – drawn 30 minutes after the end of infusion	3 ml	SST (yellow)	SERUM
39	GLUCOSE (CSF/U)	3 ml		CSF/URINE
40	GLUCOSE (S)	3 ml	SST (yellow)	SERUM
41	HAPTOGLOBIN	3 ml	SST (yellow)	SERUM
42	HDL, ULTRA	3 ml	SST (yellow)	SERUM
43	IRON	3 ml	SST (yellow)	SERUM
44	KAPPA	3 ml	SST (yellow)	SERUM
45	LACTATE DEHYDROGENASE (LDH)	3 ml	SST (yellow)	SERUM
46	LACTIC ACID *	3 ml	NaF (gray)	PLASMA
47	LAMBDA	3 ml	SST (yellow)	SERUM
48	LDL, DIRECT	3 ml	SST (yellow)	SERUM
49	MAGNESIUM (S)	3 ml	SST (yellow)	SERUM
50	MAGNESIUM (U)	3 ml		URINE
51	MICROALBUMIN	3 ml	SST (yellow)	SERUM
52	OPIATES	3 ml	SST (yellow)	SERUM
53	PHENOBARBITAL	3 ml	SST (yellow)	SERUM
54	PHENYTOIN	3 ml	SST (yellow)	SERUM
55	PHOSPHORUS (S)	3 ml	SST (yellow)	SERUM
56	PHOSPHORUS (U)	3 ml		URINE
57	POTASSIUM (S)	3 ml	SST (yellow)	SERUM
58	POTASSIUM (U)	3 ml		URINE
59	PREALBUMIN	3 ml	SST (yellow)	SERUM
60	PROTEIN (CSF/U)	3 ml		CSF/URINE
61	PROTEIN , TOTAL	3 ml	SST (yellow)	SERUM
62	SALICYLATE	3 ml	SST (yellow)	SERUM
63	SODIUM (S)	3 ml	SST (yellow)	SERUM
64	SODIUM (U)	3 ml		URINE

65	THEOPHYLLINE	3 ml	SST (yellow)	SERUM
66	TOTAL IRON BINDING CAPACITY	3 ml	SST (yellow)	SERUM
67	TRANSFERRIN	3 ml	SST (yellow)	SERUM
68	TRIGLYCERIDE	3 ml	SST (yellow)	SERUM
69	UNSATURATED IRON BINDING CAPACITY	3 ml	SST (yellow)	SERUM
70	UREA NITROGEN (S)	3 ml	SST (yellow)	SERUM
71	UREA NITROGEN (U)	3 ml		URINE
72	URIC ACIDS (S)	3 ml	SST (yellow)	SERUM
73	URIC ACID (U)	3 ml		URINE
74	VAPLROIC ACID	3 ml	SST (yellow)	SERUM
75	VANCOMYCIN** <u>TROUGH</u> – drawn within 30 minutes prior to next dose <u>PEAK</u> – drawn 30 minutes after the end of infusion	3 ml	SST (yellow)	SERUM

** For AMIKACIN, GENTAMYCIN & VANCOMYCIN – Please indicate if TROUGH, PEAK or RANDOM and indicate the Date and Time of last and next dose.

CHEMISTRY SECTION (TUMOR MARKERS, CARDIAC MARKERS AND HORMONES)				
NO.	TEST	MINIMUM VOLUME	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	ADENOCORTICOTROPIC HORMONE (ACTH)*	2 ml	EDTA (purple)	PLASMA
2	ALPHA FETO PROTEIN (AFP)	3 ml	SST (yellow)	SERUM
3	BRAIN NATRIURETIC PEPTIDE (BNP)	2 ml	EDTA (purple)	PLASMA
4	CA 125	3 ml	SST (yellow)	SERUM
5	CA 15-3	3 ml	SST (yellow)	SERUM
6	CA 19-9	3 ml	SST (yellow)	SERUM
7	CARCINOEMBRYONIC ANTIGEN (CEA)	3 ml	SST (yellow)	SERUM
8	CREATINE KINASE (CK)	3 ml	SST (yellow)	SERUM
9	CREATINE KINASE-MB (CK-MB)	3 ml	SST (yellow)	SERUM
10	CORD TSH	3 ml	SST (yellow)	SERUM
11	CORTISOL	3 ml	SST (yellow)	SERUM
12	C-PEPTIDE	2 ml	SST (yellow)	SERUM
13	DHEAS	2 ml	SST (yellow)	SERUM
14	ESTRADIOL	3 ml	SST (yellow)	SERUM
15	FERRITIN	3 ml	SST (yellow)	SERUM
16	FK 506 (TACROLIMUS)	2 ml	EDTA (purple)	WHOLE BLOOD
17	FOLATE	3 ml	SST w/ foil	SERUM
18	FREE PSA	3 ml	SST (yellow)	SERUM
19	FOLLICLE STIMULATING HORMONE (FSH)	3 ml	SST (yellow)	SERUM
20	FREE T3	3 ml	SST (yellow)	SERUM
21	FREE T4	3 ml	SST (yellow)	SERUM
22	GROWTH HORMONE (GH)	2 ml	SST (yellow)	SERUM
23	BETA HCG	3 ml	SST (yellow)	SERUM
24	HOMOCYSTEINE (HCY)	2 ml	SST (yellow)	SERUM
25	INSULIN	2 ml	SST (yellow)	SERUM
26	INTACH PARATHYROID HORMONE *	2 ml	EDTA (purple)	PLASMA
27	INSULIN GROWTH FACTOR BINDING PROTEIN 3	2 ml	SST (yellow)	SERUM

	(IGFBP3)			
28	INSULIN GROWTH FACTOR 1 (IGF1)	2 ml	SST (yellow)	SERUM
29	LUTEINIZING HORMONE (LH)	3 ml	SST (yellow)	SERUM
30	PROGESTERONE	3 ml	SST (yellow)	SERUM
31	PROLACTIN	3 ml	SST (yellow)	SERUM
32	RBC FOLATE	3 ml	EDTA w/ foil	WHOLE BLOOD
33	SIROLIMUS	2 ml	EDTA (purple)	WHOLE BLOOD
34	TESTOSTERONE	3 ml	SST (yellow)	SERUM
35	THYROGLOBULIN	3 ml	SST (yellow)	SERUM
36	TOTAL PROSTATE SPECIFIC ANTIGEN (PSA)	3 ml	SST (yellow)	SERUM
37	TROPONIN I	3 ml	SST (yellow)	SERUM
38	THYROID STIMULATING HORMONE (TSH)	3 ml	SST (yellow)	SERUM
39	VITAMIN B12	3 ml	SST (yellow)	SERUM

* TRANSPORTED WITH ICE

Table 2

BIOCHEMICAL METABOLIC SECTION (BML)				
NO.	TEST	MINIMUM VOLUME	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	25-OH VITAMIN D	4 ml	Red top w/o gel	SERUM
2	AMINO ACID	4 ml	LiH (green)	PLASMA
3	CDT	2 ml	SST (yellow)	SERUM
4	CRYOGLOBULIN	2 ml	Red top w/o gel	SERUM
5	HGB A1C	1 ml	EDTA (purple)	WHOLE BLOOD
6	VANILLYLMANDELIC ACID (VMA)	1 ml		24hr URINE
7	HOMOVANILIC ACID (HVA)	1 ml		24 hr URINE
8	5-HIAA	1 ml		Random or 24hr URINE
9	METANEPHRINE	2 ml		24hr URINE
10	NORMETANEPHRINE	2 ml		24hr URINE
11	CRYOGLOBULIN	4 ml	Red top w/o gel	SERUM
12	OXALATE	2 ml		24hr URINE
13	IFE ELECTROPHORESIS	4 ml	SST (yellow)	SERUM
14	BENCE JONES PROTEIN	5 ml		Random URINE
15	OLIGOCLONAL BAND	4 ml blood & 3 ml CSF		SERUM&CSF
16	PROTEIN ELECTROPHORESIS (SPE)	4 ml	SST (yellow)	SERUM
17	VITAMIN A	1 ml	Red top w/o gel (cover with foil)	SERUM
	VITAMIN E	1 ml	Red top w/o gel (cover with foil)	SERUM

FLOWCYTOMETRY SECTION				
NO.	TEST	MINIMUM VOLUME	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	LEUKEMIAS/LYMPHOMAS	2 ml	EDTA + NaH	WHOLE BLOOD
2	CD4/CD8 RATIO	2 ml	EDTA + NaH	WHOLE BLOOD
3	IMMUNODEFICIENCY & ACTIVATED T-CELL CD69 PANEL	2 ml	EDTA + NaH	WHOLE BLOOD
4	BURST TEST (NEUTROPHIL FUNCTION)	2 ml	EDTA + NaH	WHOLE

	TEST)			BLOOD
5	LEUCOCOUNT FOR RBC's AND PLAT	2 ml	EDTA + NaH	WHOLE BLOOD
6	PNH CD55/CD59	2 ml	EDTA + NaH	WHOLE BLOOD
7	CD34 COUNT	2 ml	EDTA + NaH	WHOLE BLOOD
8	MRD	2 ml	EDTA + NaH	WHOLE BLOOD

*** SEND SAMPLES + REQUEST FORM

HLA				
NO.	TEST	MINIMUM VOLUME	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	HLA TYPING-HLA CLASS I (A,B,C,)	20 ml	ACD or NaH	WHOLE BLOOD
2	HLA TYPING-HLA CLASS II (A,B,C)	20 ml	ACD or NaH	WHOLE BLOOD
3	HLA TYPING-HLA B27	20 ml	ACD or NaH	WHOLE BLOOD
4	CROSS MATCHING-CXM RECIPIENT	20ml ACD & 10ml RED TOP		WHOLE BLOOD
5	CROSS MATCHING-CXM DONOR	20 ml	ACD	WHOLE BLOOD
6	PANEL REACTIVE ANTIBODY (PRA)	10 ml	RED TOP	WHOLE BLOOD

*** SEND SAMPLES + REQUEST FORM

Table 3

MICROBIOLOGY SECTION					
NO.	TEST NAME	MINIMUM VOLUME REQUIRED FOR ADULT PATIENT	MINIMUM VOLUME REQUIRED FOR PEDIATRIC PATIENT	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	BLOOD CULTURE (AEROBIC,ANAEROBIC,PEDIATRIC)	10 ml	1 ml- 4 ml		WHOLE BLOOD
2	SERUM PREGNANCY	5 ml	1 ml	SST (yellow)	SERUM
3	SERUM KETONES	5 ml	1 ml	SST (yellow)	SERUM

HEMATOLOGY-COAGULATION SECTION					
NO.	TEST NAME	MINIMUM VOLUME REQUIRED FOR ADULT PATIENT	MINIMUM VOLUME REQUIRED FOR PEDIATRIC PATIENT	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	PT/PTT	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
2	FIBRINOGEN	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
3	D-DIMER	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
4	FACTOR ASSAYS: II,V,VII,VIII,IX,X,XI,XII,XIII	3.5 ml (3 TUBES)	2 ml (2 TUBES)	CITRATED TUBE (blue)	PLASMA
5	PLATELET FUNCTION ASSAY (PFA) *	3.5 ml (2 TUBES)	2 ml (2 TUBES)	CITRATED TUBE (blue)	PLASMA
6	PLATELET AGGREGATION *	3.5 ml (4	2 ml (4	CITRATED	PLASMA

		TUBES)	TUBES)	TUBE (blue)	
7	Vw AG, Vw RISTOCETIN COFACTOR, FVIII	3.5 ml 92 TUBES)	2 ml	CITRATED TUBE (blue)	PLASMA
8	LOW MOLECULAR WEIGHT HEPARIN	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
9	UF HEPARIN	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
10	PROTEIN S & C, AT III, APC R	3.5 ml (2 TUBES)	2 ml (2 TUBES)	CITRATED TUBE (blue)	PLASMA
11	BETHESDA	3.5 ml (3 TUBES)	2 ml (3TUBES)	CITRATED TUBE (blue)	PLASMA
12	THROMBIN TIME	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
13	REPTILASE TIME	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
14	LUPUS	3.5 ml	2 ml	CITRATED TUBE (blue)	PLASMA
15	CBC + DIFFERENTIAL	3 ml	1 ml	EDTA (purple)	WHOLE BLOOD
16	ESR	4 ml	2 ml	EDTA (purple)	WHOLE BLOOD
17	G6PD QUANTITATIVE	1 ml	0.4 ml	EDTA (purple)	WHOLE BLOOD
18	HEINZ BODY STAIN	2 ml	0.5 ml	EDTA (purple)	WHOLE BLOOD
19	HGB ELECTROPHORESIS	4 ml	2 ml	EDTA (purple)	WHOLE BLOOD
20	RETICULOCYTE COUNT	2 ml	0.3 ml	EDTA (purple)	WHOLE BLOOD
21	SICKLE CELL SCREEN	4 ml	2 ml	EDTA (purple)	WHOLE BLOOD

LEGEND: * NEEDS BOOKING, CALL COAGULATION SECTION AT EXTENSION 11282

MOLECULAR BIOLOGY SECTION (MBL)

NO.	TEST NAME	MINIMUM VOLUME REQUIRED FOR ADULT PATIENT	MINIMUM VOLUME REQUIRED FOR PEDIATRIC PATIENT	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	DNA BANKING *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
2	HEREDITARY HEMOCHROMATOSIS *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
3	SPINAL MUSCULAR ATROPHY *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
4	DUCHENNE MYOTONIC DYSTROPHY *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
5	FACTOR V LEIDEN MUTATION *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
6	PROTHROMBIN II MUTATION/FACTOR II MUTATION/P20210 GENE MUTATION *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
7	METHYLENE TETRAHYDRO FOLATE REDUCTASE *	3 ml	1.5 ml	2 EDTA (purple)	WHOLE BLOOD
8	PRADER WILLI SYNDROME SNRPN **	3 ml		2 EDTA (purple)	WHOLE BLOOD
9	BCR/ABL P210 (CML) **	3 ml		2 EDTA (purple)	WHOLE BLOOD
10	BCR/ABL P190 (ALL) **	3 ml		2 EDTA (purple)	WHOLE BLOOD
11	PML – RARA **	3 ml		2 EDTA (purple)	WHOLE BLOOD

Table 4

TRANSFUSION MEDICINE SERVICES - BLOOD BANK						
NO.	TEST NAME	MINIMUM VOLUME REQUIRED FOR ADULT PATIENT	MINIMUM VOLUME REQUIRED FOR PEDIATRIC PATIENT	MINIMUM VOLUME REQUIRED FOR NEONATES PATIENT	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	TYPE AND SCREEN / CROSSMATCHING	3 ml	2 ml	1 ml	EDTA (purple)	WHOLE BLOOD
2	DIRECT COOMB'S TEST (DAT BLANK)	3 ml	2 ml	1 ml	EDTA (purple)	WHOLE BLOOD
3	TRANSFUSION REACTION INVESTIGATION	3 ml	2 ml	1 ml	EDTA (purple)	WHOLE BLOOD

ALL BLOOD BANK SAMPLES SHOULD BE LABELLED HANDWRITTEN WITH PATIENTS MRN AND FULL NAME, DATE AND TIME OF COLLECTION, COLLECTOR'S BADGE NUMBER.

Table 5

IMMUNOLOGY - SEROLOGY SECTION					
NO.	TEST NAME	MINIMUM VOLUME REQUIRED FOR ADULT PATIENT	MINIMUM VOLUME REQUIRED FOR PEDIATRIC PATIENT	COLLECTION TUBE TO USE	SAMPLE REQUIREMENT
1	ALBUMIN (CSF)	0.5 ml	1 ml		CSF
2	ANTI-CARDIOLIPIN ANTIBODY (ACA AB)	7 ml	1 ml	SST w/ gel (yellow)	SERUM
3	ANTI-CCP IgG ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
4	ANTI-ENDOMYSIAL ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
5	ANTI-GLOMERULAR BASEMENT MEMBRANE (GBM)	5 ml	2 ml	SST w/ gel (yellow)	SERUM
6	ANTI-GLIADIN IgA	5 ml	1 ml	SST w/ gel (yellow)	SERUM
7	ANTI-GLIADIN IgG	5 ml	1 ml	SST w/ gel (yellow)	SERUM
8	ANTI-HEPARIN PLATELET FACTOR AB (HIT)	5 ml	1 ml	CITRATED TUBE (blue)	PLASMA
9	ANTI-ISLET CELL AUTOANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
10	ANTI LIVER/KIDNEY MICROSOMAL ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
11	ANTI-MITOCHONDRIAL ANTIBODY (AMA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
12	ANTI-NATIVE DEOXYRIBONUCLEIC ACID (DNA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
13	ANTI-NEUTROPHILIC CYTOPLASMIC AB(C&P ANCA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
14	ANTI-NUCLEAR ANTIBODY (ANA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
15	ANTI-RNP ANTIBODY	5 ml	1 ml	SST w/ gel	SERUM

				(yellow)	
16	ANTI-SCL 70 ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
17	ANTI-SMITH ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
18	ANTI-SMOOTH MUSCLE ANTIBODY (ASMA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
19	ANTI-SS-A ANTIBODY (ANTI-RO)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
20	ANTI-SS-B ANTIBODY (ANTI-LA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
21	ANTI-STREPTOLYSIN O (ASOT)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
22	ANTI-STREPTOZYME ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
23	ANTI-THYROGLOBULIN AB (htg)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
24	ANTI-THYROID PEROXIDASE AB (TPO)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
25	BETA 2 GLYCOPROTEIN IgA, IgM, IgG	5 ml	1 ml	SST w/ gel (yellow)	SERUM
26	BRUCELLA ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM/CSF
27	CHLAMYDIA ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
28	CMV IgG	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
29	CMV IgM	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
30	COLD AGGLUTININS	5 ml	1 ml	SST w/ gel (yellow)	SERUM
31	CONFIRMATORY TEST FOR HEPATITIS B SURFACE ANTIGEN	10 ml	0.5 ml	SST w/ gel (yellow)	SERUM
32	CONFIRMATORY TEST FOR HEPATITIS C VIRUS	5 ml	0.3 ml	SST w/ gel (yellow)	SERUM
33	C-REACTIVE PROTEIN (CRP)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
34	CRYPTOCOCCAL ANTIGEN DETECTION	5 ml	1 ml	SST w/ gel (yellow)	SERUM
35	DENGUE IgG & IgM	5 ml	1 ml	SST w/ gel (yellow)	SERUM
36	EBNA-G	5 ml	1 ml	SST w/ gel (yellow)	SERUM
37	EBV-EA	5 ml	1 ml	SST w/ gel (yellow)	SERUM
38	EBV-IgG	5 ml	1 ml	SST w/ gel (yellow)	SERUM
39	EBV-IgM	5 ml	1 ml	SST w/ gel (yellow)	SERUM
40	FEBRILE AGGLUTININS	10 ml	1 ml	SST w/ gel (yellow)	SERUM
41	FTA-ABSORBTION	5 ml	1 ml	SST w/ gel (yellow)	SERUM
42	FUNGAL SEROLOGY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
43	GASTRIC PARIETAL CELL ANTIBODY (GPA)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
44	GLUTAMATE DECARBOXYLASE	2 ml	1 ml	SST w/ gel	SERUM

	(GAD)			(yellow)	
45	HEPATITIS A VIRUS IgG ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
46	HEPATITIS A VIRUS IgM ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
47	HEPATITIS B ANTIGEN	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
48	HEPATITIS B SURFACE ANTIGEN QUALI	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
49	HEPATITIS B SURFACE ANTIGEN QUANTI	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
50	HEPATITIS B CORE ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
51	HEPATITIS B SURFACE ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
52	HEPATITIS C VIRUS ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
53	HEPATITIS D VIRUS ANTIBODY	5 ml	0.3 ml	SST w/ gel (yellow)	SERUM
54	HERPES SIMPLEZ TYPE 1&2 IgM	5 ml	2 ml	SST w/ gel (yellow)	SERUM
55	HERPES SIMPLEX TYPE 1&2 IgG	5 ml	2 ml	SST w/ gel (yellow)	SERUM
56	HIV Ag/Ab	10 ml	0.5 ml	SST w/ gel (yellow)	SERUM
57	HIV CONFIRMATORY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
58	HTLV 1&2 ANTIBODY	10 ml	0.5 ml	SST w/ gel (yellow)	SERUM
59	HTLV 1&2 CONFIRMATORY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
60	HUMAN TISSUE TRANSGLUTAMINASE ANTIBODY (h-tTg IgA)	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
61	HUMAN TISSUE TRANSGLUTAMINASE ANTIBODY (h-tTg IgG)	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
62	IMMUNO CAP PHADIATOP	6 ml	1 ml	SST w/ gel (yellow)	SERUM
63	IMMUNO CAP SPECIFIC IgE	6 ml	1 ml	SST w/ gel (yellow)	SERUM
64	IMMUNO CAP TOTAL IgE	6 ml	1 ml	SST w/ gel (yellow)	SERUM
65	IMMUNOGLOBULINS (IgA, IgM, IgG)	5 ml	1 ml	SST w/ gel (yellow)	SERUM
66	INFECTIOUS MONONUCLEOSIS	6 ml	1 ml	SST w/ gel (yellow)	SERUM
67	INFLUENZA VIRUS A IgG	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
68	INFLUENZA VIRUS B IgG	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
69	MALARIA TOTAL ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
70	MEASLES IgG ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
71	MEASLES IgM ANTIBODY	5 ml	2 ml	SST w/ gel (yellow)	SERUM
72	MUMPS IgG ANTIBODY	5 ml	0.5 ml	SST w/ gel	SERUM

				(yellow)	
73	MUMPS IgM ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
74	MYCOPLASMA IgG	5 ml	1 ml	SST w/ gel (yellow)	SERUM
75	MYCOPLASMA IgM	5 ml	1 ml	SST w/ gel (yellow)	SERUM
76	PARASITIC SEROLOGY (AMOE-ECHINO-SCHISTO-LESHM.)	7 ml	0.5 ml	SST w/ gel (yellow)	SERUM
77	PARVO VIRUS B19 IgG & IgM	5 ml	1 ml	SST w/ gel (yellow)	SERUM
78	QUANTIFERON TB **	1 ml in each tube	1 ml in each tube	SPECIAL TUBE c/o SEROLOGY	SERUM
79	RHEUMATOID FACTOR	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
80	RUBELLA - IgG	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
81	RUBELLA IgM	3 ml	0.3 ml	SST w/ gel (yellow)	SERUM
82	SYPHILIS TOTAL ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
83	TETANUS ANTIBODY	5 ml	1 ml	SST w/ gel (yellow)	SERUM
84	TOXOPLASMA IgG ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
85	TOXOPLASMA IgM ANTIBODY	5 ml	0.5 ml	SST w/ gel (yellow)	SERUM
86	VARICELLA IgM	5 ml	2 ml	SST w/ gel (yellow)	SERUM
87	VARICELLA ZOSTER IgG	5 ml	2 ml	SST w/ gel (yellow)	SERUM
88	VDRL (CSF)	0.5 ml	0.2 ml		CSF

Table 6

VIROLOGY SECTION				
NO.	TEST NAME	MINIMUM VOLUME	TUBE/CONTAINER TO BE USE	SAMPLE REQUIREMENT
1	ADENOVIRUS ANTIGEN DETECTION	1 ml / 1 swab (ophthalmic specimens)	Sterile container/ Swab	<ul style="list-style-type: none"> •Nasopharyngeal Aspirate; Bronchial washing/brushing •Ophthalmic specimens
2	CHLAMYDIA TRACHOMATIS DIRECT SPECIMEN TEST	2 Chlamydia slides	Special slides (Oracle # 106666)	<ul style="list-style-type: none"> •Urethral, Cervical, Rectal, Conjunctival, Nasopharyngeal Aspirate
3	CYTOMEGALOVIRUS CULTURE		Sterile leak-proof container / Swab	<ul style="list-style-type: none"> •Urine, Saliva, Sputum, Aspirates, CSF •Tissue: <ul style="list-style-type: none"> •Autopsies/Biopsies •Throat swabs •Bronchoalveolar Lavage (BAL)
4	CMV PP65 ANTIGENEMIA	3-5 ml	2 EDTA	WHOLE BLOOD
5	HSV I / HSV II DIRECT SPECIMEN IDENTIFICATION TEST		Swab	Vesicular Lesion

6	HSV I / HSV II VIRUS ISOLATION (CULTURE)	1 ml	Sterile leak-proof container / Swab	•CSF, Throat washing, Nasopharyngeal washing •Vesicular lesions, Throat swab, Eye exudates, Nasopharyngeal swab
7	INFLUENZA VIRUS A & B ANTIGEN DETECTION	1 ml	Sterile container	•Nasopharyngeal Aspirate •Bronchial washing/brushing
8	PARAINFLUENZA VIRUS 1, 2, 3 ANTIGEN DETECTION	1 ml	Sterile container	•Nasopharyngeal Aspirate •Bronchial washing/brushing
9	RESPIRATORY SYNCYTIAL VIRUS ANTIGEN DETECTION	1 ml	Sterile container	•Nasopharyngeal Aspirate •Bronchial washing/brushing
10	INFECTIOUS PCR's (HBV-DNA PCR, HCV-DNA PCR, HIV PCR, CMV PCR, HSV PCR, etc.)	3-5 ml	2 EDTA	WHOLE BLOOD

Table 7

SPECIAL LABORATORY TESTS (FOR NEONATES)

TEST NAME	MINIMUM VOLUME	COLLECTION TUBE TO BE USE	SPECIAL INSTRUCTION	CONSENT FORM NEEDED
AMMONIA	1 ml	Green (Sodium Heparin)	Sent on ice. Do not use tourniquet.	NO
AMINO ACID (blood)	2 ml	Green (Lithium Heparin)	Extract blood 4-6 hrs after meal	NO
AMINO ACID (csf)	1 ml	CSF + EDTA (purple)		NO
ACTH	1 ml	Purple (EDTA)	Sent on ice.	NO
ARYL SULFATASE	10 ml	Green (Sodium Heparin)	Send-Out every Sunday, Tuesday & Wednesday before 0930am + Routine Lab Request Form	NO
ALPHA-1-ANTITRYPSIN GENE MUTATION	1-2 ml	Yellow (SST)		NO
ALPHA FETO PROTEIN (AFP)	2 ml	Yellow (SST)		NO
ALPHA GALACTOSIDASE	10 ml	Green (Sodium Heparin)	Send-Out every Sunday, Tuesday & Wednesday before 0930am + Routine Lab Request Form	NO
ANTIPHOSPHOLIPIDS	2 ml	Yellow (SST)		NO
ANTI-THROMBIN III	3 ml	Blue (Sodium Citrate)	Do not draw from heparinized line. Send to lab immediately.	NO
ARRAY - CGH	3 ml each	Purple (EDTA)	Molecular Lab ext. 11680 DNA Banking Request + Consent Form.	YES

			Send between 0800-1700hr. Specimen will be sent to USA	
ARX GENE	3 ml each	Purple (EDTA)		NO
BETA GALACTOSIDASE	10 ml	Green (Sodium Heparin)	Send-Out every Sunday, Tuesday & Wednesday before 0930am + Routine Lab Request Form	NO
BIOTINIDASE ACTIVITY	3 ml	Yellow (SST)		NO
BONE MARROW ASPIRATE	0.5–1 ml	Purple (EDTA)	On Ice, Sunday to Thursday	NO
BRUCELLA TITER	2-3 ml	Yellow (SST)		NO
CARNITINE/L-CARNITINE	4 ml	Yellow (SST)		NO
CDKL 5 GENE	0.6 ml	Purple (EDTA)		NO
CDT	2 ml	Yellow (SST)		NO
C PEPTIDE	2 ml	Yellow (SST)	Schedule Q Tuesday, NPO, avoid hemolysis	NO
CLOTTING FACTOR ASSAY (FII, FV, FVIII, FIX, FXI, FXII)	2 ml	Blue (Sodium Citrate)		NO
CORTISOL	1 ml	Yellow (SST)	Time of collection must be written in the request form	NO
CHROMOSOMAL ANALYSIS	2 ml	Green (Sodium Heparin)	Need Form for Chromosomal Analysis Request. Done on Sunday to Thursday.	NO
CMV PP65	1 ml each	2 Purple (EDTA)	With Lab Request Form. Done WEEKDAYS only. Cut-Off: 10am	NO
C-REACTIVE PROTEIN (CRP)	1 ml	Yellow (SST)		NO
CHIMERISM Pre-Transplant	3.5 ml each	Purple (EDTA)	Samples are accepted until 0900 am only. Booking required.	NO
CHIMERISM Post-Transplant	6 ml	2 Purple (EDTA) + 1 ACD tube	Samples are accepted until 0900 am only. From Sunday to Tuesday. Booking required.	NO
COL 3A1 GENE	6 ml	Blue (5 tubes)		NO
DNA BANKING	3 ml each	2 Purple (EDTA)	Anytime of the day. Inform Molecular Biology Section first ext. 11680. DNA Banking Request form + Consent	YES
ESR	1.5-2 ml	Purple (EDTA)	Send anytime. Mix immediately by inverting the tube 15-20x	NO
FACTOR V	2 ml	Blue (Sodium Citrate)	Collect amount till the black mark.	NO
FACTOR XIII	2 ml	Blue (Sodium Citrate)	Sample should not be collected from heparinized line.	NO
FACTOR V LEIDEN	2 ml	Purple (EDTA)	With MBL Request Form + Consent	YES
FISH STUDY – Fluorescent In Situ Hybridization for D'George Syndrome	2-3 ml	Green (Sodium Heparin)	Secure transport media from Receiving section. Inquire from MBL ext.	NO

			11680. Use Chromosomal Analysis Request Form.	
FIBRINOGEN	2 ml	Blue (Sodium Citrate)		NO
FREE FATTY ACID	0.6-1.2 ml	Yellow (SST)	Send-Out to Bioscientia. Use Routine Lab Request Form	NO
FERRITIN	1-2 ml	Yellow (SST)		NO
FOLATE	1 ml	Yellow (SST)	Avoid hemolysis. Protect from light (cover with foil)	NO
RBC FOLATE	1 ml	Purple (EDTA)	Avoid hemolysis. Protect from light (cover with foil)	NO
FT4	1 ml	Yellow (SST)		NO
FANCONI ANEMIA/Chromosomal Breakage Analysis/Chromosomal Fragility Test	3.5 ml each	4 Purple tubes (EDTA) + 1 Green (Sodium Heparin)	Booking required in MBL ext. 11680. Samples are accepted only on Sunday & Monday before 0900 am.	NO
FUNCTIONAL PROTEIN C PROTEIN S FREE	2 ml	Blue (Sodium Citrate)		NO
GAL-1-PHOSPHATE	2 ml	Purple (EDTA)	Send-Out to Bioscientia. Use Routine Lab Request Form.	NO
GROWTH HORMONE	2 ml	Yellow (SST)	Schedule Wednesday. Avoid hemolysis.	NO
GLUCOSE	0.6 ml	Yellow (SST)		NO
NEWBORN SCREENING	1 pc.	Newborn Blood Card	All babies admitted in NICU will have at least 3 NBS test. First upon admission, Second 48hrs of life, Third upon discharge or at 28 days of life (which ever comes first). This will be done no matter whether the baby was on TPN or had a blood transfusion. Blood transfusions only affect ONE of the NBS results (GALT) so if the baby was transfuse, a fourth specimen will be sent 120 days after the last transfusion.	NO
25-OH VITAMIN D	2-3 ml	Red top(Plain)		NO
PFI C II GENE MUTATION	3 ml	Purple (EDTA)	Misc. Form; Molecular Lab ext. 11680	NO
PYRUVATE	1 ml	Special tube from the receiving lab		NO
PLATELET AGGREGATION	2 ml	4-5 Blue tubes (Sodium Heparin)	NPO. Call ext. 11282 for booking. Blood should be collected by 0800am.m Specimen must be delivered to the lab immediately handheld.	NO
BIOTINIDASE	2ml	Yellow (SST)	Send-Out to Bioscientia. Use Routine Lab Request Form.	NO
PARATHYROID HORMONE (PTH)	1-2 ml	Purple (EDTA)	Send on ICE.	NO

PROTEIN C; PROTEIN S	2.7 ml	Blue (Sodium Citrate)	Do not draw from heparinized line. Specimen must be mixed immediately by gently inverting the tube 3-5x. Send to the lab immediately.	NO
PRADER-WILLI SYNDROME	3.5 ml	Purple (EDTA)	On Ice, immediately transport to MBL Sunday to Thursday.	NO
RING CHROMOSOMES 20	1-2 ml	Green (Sodium Heparin)		NO
RIPK 4	7 ml	Red Top		NO
RNA SAMPLES (BCR-ABL, PML-RARA and other ONCOLOGY samples)	3.5 ml each	2 Purple tubes (EDTA)	On Ice. Send Lab Request Form. Sunday to Thursday.	NO
SICKLE CELL SCREEN	1-2 ml	Purple (EDTA)		NO
HOMOCYSTEINE	1 ml	Yellow (SST)	Schedule Monday. NPO	NO
HEMOGLOBIN ELECTROPHORESIS	1-2 ml	Purple (EDTA)		NO
17 OH PROGESTERONE	3-4 ml	Yellow (SST)	Use regular request form. Send-Out to Bioscientia.	NO
JAK II GENE MUTATION	3 ml each	2 Purple tubes (EDTA)	Molecular Biology ext 11680. Use Molecular Request Form + Consent	YES
LACTIC ACID	1 ml	Gray (Sodium Fluoride)	Send On-ICE.	
MOLECULAR TESTING MK 53 – MK 54	3-5 ml	Purple (EDTA)	Use Molecular Request Form + DNA Banking Consent.	YES
CDK 25 MUTATION	0.6 ml each	2 Purple microtainer (EDTA)	Use Molecular Request Form + DNA Banking Consent.	YES
NCL	5-10 ml	Special Blood Card from Bioscientia	Neurological Cerebro Lipophygenosus. Use regular Lab Request Form. Send Out to Bioscientia.	NO
ZINC	2 ml	Royal Blue Top		NO
TESTOSTERONE	1-1.5 ml	Yellow (SST)		NO
TSH	1-2 ml	Yellow (SST)		NO
TORCH	3-4 ml	Yellow (SST)		NO
ORGANIC ACID (urine)	10 ml		Use Faisal Form (National Laboratory for Newborn Screening)	NO
SULPHOCYSTEINE (urine)	10 ml		Use Faisal Form (National Laboratory for Newborn Screening)	NO

SUCCINYLACETONE (random urine)	10 ml		Use Faisal Form (National Laboratory for Newborn Screening)	NO
URIC ACID	0.6 ml	Yellow (SST)		NO
VITAMIN B12	1 ml	Yellow (SST)		NO
VITAMIN A	1 ml	Yellow (SST)	Protect from light (cover with foil)	NO
VITAMIN E	1 ml	Yellow (SST)	Protect from light (cover with foil)	NO
VITAMIN D 1.25	2-3 ml	Yellow (SST)		NO
VITAMIN B1	5 ml	Purple (EDTA)	Protect from light (cover with foil)	NO
VITAMIN B2	2-5 ml	Purple (EDTA)	Protect from light (cover with foil) Send-Out to Bioscientia. Use regular Lab Request form	NO
VITAMIN B6	3 ml	Purple (EDTA)	Protect from light (cover with foil). Send-Out to Bioscientia. Use regular Lab Request form	NO
VLCFA	3 ml	Purple (EDTA)	Use Faisal Form	NO
SPINA MUSCLE ATROPHY	1.5 ml each	4 Purple tubes (EDTA)	Consent from Parents Request – Molecular Pathology Form for Genetics Disease	YES
VON WILLI BRAND FACTOR ANTIGEN, RISTOCETIN CO-FACTOR ASSAY	2 ml	Blue (Sodium Citrate)	Need booking. Call ext. 11282 1 day before collecting blood.	NO
WRFL samples/Interleukins Recurrent Abortion Project	3 ml each	2 Purple tubes (EDTA)	Samples are accepted until 1600hr from Sunday to Thursday & will be sent to Research Laboratory.	NO

23.2 SEND OUT/REFERRED TESTS:

We have **TWO REFERRAL LABORATORIES** where the samples are sent:

- ❖ **BIOSCIENTIA Laboratory** – every SUNDAY, TUESDAY and WEDNESDAY
- ❖ **KING FAISAL SPECIALIST HOSPITAL Laboratory** – everyday (Sunday – Thursday) except weekends
 - a. RESEARCH LAB
 - b. REFERENCE LAB

The average turnaround time from specimen collection until a report is available on the chart is approximately **10 DAYS**. Samples are always submitted with a completely filled up request form.

***** List of SEND OUT/REFERRED TESTS is available in the intranet**

24. DEPARTMENT OF PATHOLOGY AND LABORATORY CONTACT NUMBERS

Table 8

RECEIVING AREA	11274/ 11176
REFERRAL AREA	13261
	FAX NUMBER 11174
ER RUNNERS	13976
ACC AREA (OUTPATIENT LABORATORY)	18675
CHEMISTRY	12670/ 11261/ 11262
HEMATOLOGY	11281
COAGULATION	11282
BLOOD BANK	11276/ 11251
SEROLOGY	11355
METABOLIC LAB	40915/ 40916/ 40917
MICROBIOLOGY	11235/ 11273
MOLECULAR BIOLOGY (MBL)	11680
URINALYSIS	11315
CYTOGENETICS	49169
TOXICOLOGY	18483
HISTOPATHOLOGY	12145/11283
CYTOLOGY	11459
VIROLOGY	17480
FLOWCYTOMETRY	11255
HLA	11260
NEUROGENETICS	16665

For Further Information Please Contact:

MS. RAMOU SARR

Receiving and ACC Supervisor

Department of Pathology & Laboratory Medicine

King Abdulaziz Medical City

Ministry of National Guard Health Affairs

Extension 13353 / Pager 5261

Ramous@ngha.med.sa