CENTRAL LABORATORY

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HANDBOOK FOR CENTRAL LABORATORY SERVICE-KBTH **KBTH-CL/CS/0711** **VERSION 4**		
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8/11/2021			*K.O.A*
8/11/2022			*K.O.A*
8/11/2023			*G.K.K*
	08/08/2024	Added staff medicare	*G.K.K.*
	08/08/2025	Handwashing, advisory services and general guidelines added	*SK*
Distribution:			

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#1 Chemical Pathology Dept.	#7 Stores	#13 KBTH website	# 19 Plastics	# 25 X-ray Dept.
#2 Haematology Dept.	#8 Information Technology Unit	#14 DMA	# 20 Accident & Emergency	# 26 Radiotherapy
#3 Immunology Dept.	#9 Maternity lab	#15 Maternity	# 21 Dental dept.	# 27 Chest Clinic
#4 Microbiology Dept.	#10 Chest Clinic lab	#16 Child Health	# 22 Eye	
#5 Client Service Dept.	#11 Child Health lab	#17 Medical	# 23 Polyclinic- KBTH	
#6Quality Assurance Office	#12 Fevers Unit lab	#18 Surgical	# 24 Fevers Unit	
Date of Discontinuation:				



HANDBOOK FOR CENTRAL LABORATORY SERVICE-KBTH

KBTH-CL/CS/0711 (5rd edition)

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INTRODUCTION

The Central Laboratory Service of the Korle-Bu Teaching Hospital, together with its satellite laboratories forms the Lab SUB BMC. It is a well-equipped modern diagnostics facility located at the centre of the hospital bounded by the Gynaecology Department, the Department of Medicine (Medical block), the Maxillofacial and Haematology blocks as well as wards G and E. The facility is run by highly trained personnel made up of Biomedical Scientists, Medical Laboratory Technicians, and Support Services personnel.
Together, we provide a comprehensive analytical, diagnostic and advisory service in Chemical Pathology, Haematology, Microbiology and Immunology.

The Biomedical Scientists with the assistance of Medical Laboratory Technicians provide expert analytical services in all departments of the laboratory.

The department operates a 24-hour service all days of the week, including public holidays on three shifts.

During the service hours of 08:00 to 17:00 hours a laboratory Officer/Client Service Officer (CSO) is at post and from whom information regarding test availability, advice and general information relating to operational procedures may be obtained.

Investigations of an urgent nature must always be made known to the Officer (CSO) prior to or when the sample is brought to the laboratory.

In the event that an urgent investigation is required outside of the regular working hours of 08:00 to 17:00 hours, the Biomedical Scientist (BMS) on duty in the department concerned should be first informed.
By its nature, this handbook is unable to cover all the anticipated change in services that will be offered by the laboratory. However, senior members of the department are always happy to discuss the changing needs of users and to advice on the most appropriate choice of tests. This manual will be reviewed with the approval of laboratory management yearly.

VISION

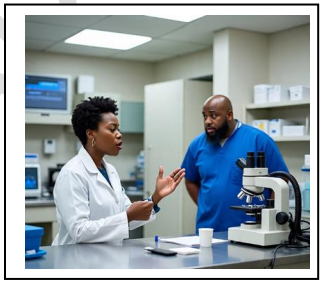
To become a centre of excellence in Laboratory Diagnostic services and the most preferred point/ facility in Medical Laboratory Services within the West African Sub region.

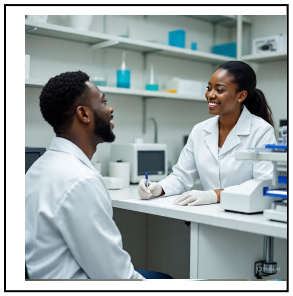
MISSION

Working in a team with other SUB BMCs to provide the highest quality of timely and efficient lab services and to ensure excellence in teaching and research with highly competent and well-motivated staff.

Advisory Services

The laboratory provides advisory services on laboratory best practices, test choice, result interpretation, frequency of examination, clinical case advice, effective utilization of laboratory service and turnaround time. Contact the laboratory reception to access advisory services. All delays in laboratory services which arise from service interruptions are published on the *official hospital website* and/or as approved notices in the laboratory reception





SENIOR CLINICAL, ACADEMIC, ADMINISTRATIVE, SCIENTIFIC & TECHNICAL STAFF

Head of Department

Laboratory Manager

Administrator (Laboratory)

Quality Manager

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Health and Safety Officer

Client Service Officer (CSO)

Accountant

Technical Supervisor, Haematology Dept.

Technical Supervisor, Chemical Path. Dept.

Technical Supervisor, Microbiology Dept.

Technical Supervisor, Immunology Unit.

Dep. Tech. Supervisor, Haematology Dept.

Dep. Tech. Supervisor, Chemical Path. Dept.

Dep. Tech. Supervisor, Immunology Unit.

Dep. Tech. Supervisor, Microbiology Dept.

Dep. Quality Manager

TELEPHONE NUMBERS

For all telephone enquiries, please call 0302-739510/0302273952. The various extension lines are provided.

Office	**Extension**
Store	4031
Front desk	4200
Manager	4201
Head of Department	4202
Secretariat	4303
Chemistry	4204
Head of Acount	4205
Microbiology room 28	4206
Results collection	4207
Account office	4208
Bank	4209
NHIS	4210
HAEMATOLOGY (MANUAL)	4212
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MICROBIOLOGY OFFICE	4214
MICROBIOLOGY (PARASITOLOGY)	4215
IMMUNOLOGY	4220
HAEMATOLOGY (AUTOMATION)	4223
IT OFFICE	4234
CELL BIOLOGY	4235

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OPERATIONAL HOURS

ROUTINE ANALYTICAL SERVICE

The departments offer 24-hour service for all routine tests.

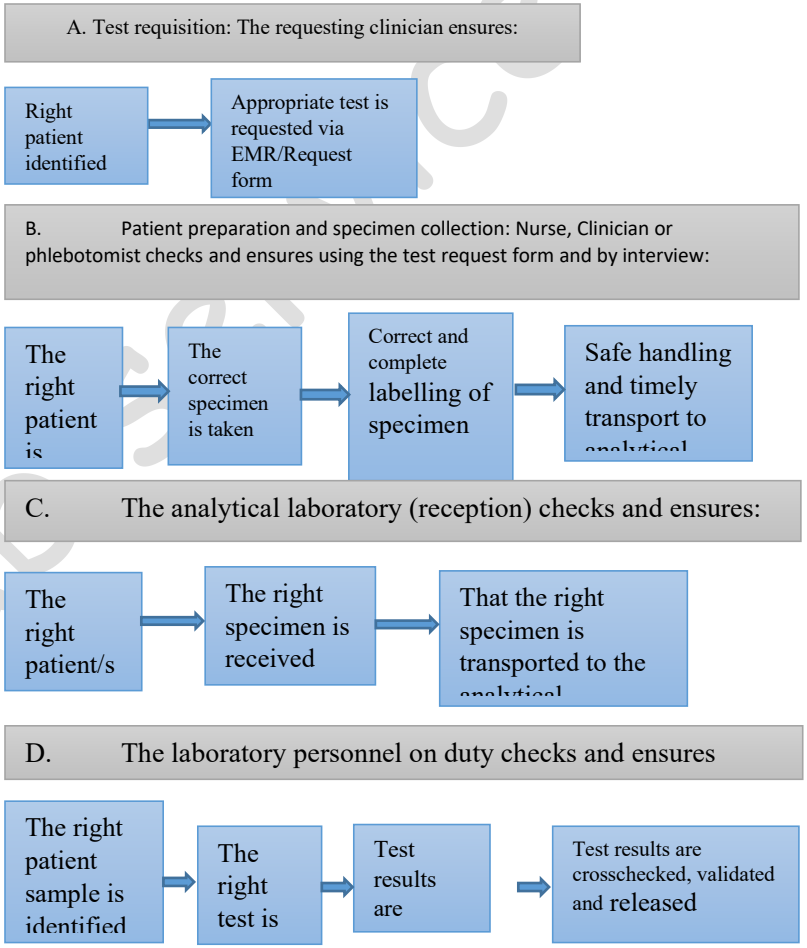
To ensure same day reporting, reports for routine requests received from outpatients before 12.00 will be available on the same day. For in patients however, results will be made available on the same day. 80% of routine requests are processed within 3 hours of receipt by the laboratory. Patients should present their receipt of payment at the result collection point to collect their test results.

Routine analytical service covers in excess of 80% of the workload of the laboratory and represents those analytes measured on a daily basis which will normally be reported on the day the sample is received. Details of such analytes are listed in Appendix A.

BATCHED ANALYTICAL SERVICE

Much of the remaining analytical work out in the laboratory is done on a batched basis. By batched basis we mean that samples are pooled and run on specific days. Specimens are dealt with in order of receipt and included in the next available batch for assays. Estimates of likely delays in analysis can usually be given for these analytes. Where adequate reasons can be given, samples can occasionally be included in an earlier batch or the timing of a particular batch run changed to expedite processing. Details of such analytes are given in Appendix B.

URGENT ANALYTICAL REQUESTS



The lab offers a 24-hour service for all urgent cases. This service complements the routine procedures during regular laboratory hours. The urgent requests may be for routine analytes (Ref: Appendix A) or batched analytes (Ref: Appendix B).

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All requests for urgent analysis must be made through the Officer/CSO when the request or specimen is brought in between the hours of 8.00 and 17.00 or the BMS on duty between the hours of 17.00 and 8:00. Arrangements during public holidays may vary. The laboratory should be contacted for specific details.

Urgent requests are handled individually as soon as the sample reaches the laboratory and the clinician telephoned when results are ready or sent via the Laboratory attendant or relatives of the patient.

Urgent requests are extremely demanding of the laboratory resources and so in order not to delay the truly urgent requests, the department operates the following strict policy for requests marked urgent.

CALL REQUEST FOR STAT ANALYSIS

Where the requesting clinician has notified (in the form of a written note) and agreed with the Laboratory Officer/CSO a STAT request, the laboratory will process the request and inform the clinician as soon as the results are available. To facilitate this process, the request form must be properly and completely filled with the required details

ALL OTHER REQUESTS FOR STAT ANALYSIS:

Where the requesting clinician has not notified nor agreed on the request with the Laboratory Officer even where the request form is marked *Urgent* in any way, the laboratory will process the request in a routine mode with a probable turnaround time for routine test of up to 3 hours barring all unforeseen circumstances. The Laboratory will not phone to inform that the results are ready. They will be subject to the usual computerized checking procedures. Critical results from such specimens may be brought to the attention of the Laboratory Officer at whose discretion such results may be phoned to the requesting physician.

The laboratory defines an Urgent Request as analysis required for **immediate** in-patient management.

VERBAL/ORAL REQUESTS

Oral requisition is not the usual test requisition method practised in the central laboratory. However, the laboratory has a procedure for managing oral request for examinations, if applicable that includes the provision of documented confirmation of the examination request to the laboratory within a given time.

All fields in the laboratory request must be filled completely. For accurate and reliable results, a short history or diagnosis must always be included in the lab request.

CONFIDENTIALITY

The laboratory is committed to maintaining the confidentiality of all test results and patients requiring laboratory services. The laboratory therefore restrict access to laboratory testing areas. To protect patient information, data and system, the LHIMS is accessible ONLY by laboratory personnel and authorized health professionals. Our personnel ensure that conflict of interest are

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declared such that financial, economic pressures do not compromise patient safety.

When the laboratory is required by law or authorized by contractual arrangements to release confidential information, the patient concerned is notified of the information released, unless prohibited by law. Information about the patient from a source other than the patient (e.g. complainant, regulator) is kept confidential by the laboratory. The identity of the source is kept confidential by the laboratory and not shared with the patient, unless agreed by the source.

PATIENT CONSENT

The laboratory considers the test request form presented by the patient as consent to perform test procedures. However, testing procedures are explained to the patient before sample collection

All clinical information regarding a patient is only disclosed to the requesting clinician

For blood transfusion the consent form printed at the back of transfusion request form is completed before the sample is collected for cross matching.

RESOLUTION OF COMPLAINTS

Central Laboratory has a Complaint Resolution Procedure to receive, record, investigate and resolve complaints from the users of the laboratory. Complaints are received through the suggestion box, phone calls from clinicians and other parties filling online google complain form via scanning if QR code, consultative meetings as well as verbal complaints and are recorded. Central laboratory investigates the genuineness of all complaints and takes the appropriate corrective action. The laboratory also conducts customer surveys periodically; data from customer satisfaction surveys is analyzed for improvement of laboratory services.

SPECIMEN COLLECTION

It is important that persons responsible for collecting specimens ensure that all specified collection conditions are met particularly in relation to timing, fasting conditions and drug given.

Major sources of analytical variation can be introduced by failing to adhere to recommended collection conditions. Such analytical variation may often not be apparent to the laboratory and can generate misleading results.

It is in the interest of all concerned to ensure that specimens are taken appropriately and delivered promptly to the laboratory; in particular, attention is drawn to the following in order to obtain valid results:

- Always avoid prolonged stasis when taking blood.
- Always avoid contamination of the sample with IV fluids.
- Never mix blood from one specimen container with another.
- Always keep timed urine collections cool during the collection period.
- Always **label** specimens clearly with **Name, Date, Time** and **tests**. The LHMHIS number provides adequate details of the patient and can be used as a label. Inadequately labelled specimens will not be analysed.
- Always fill in the sample collection details on the request form.
- Always, use birth dates to distinguish between patients with similar names on the ward.

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- Always send samples to the specimen collection point of the laboratory without delay.

- Always send samples to the laboratory in individual biohazard bags if available, with the request form in the separate pocket.
- **Request forms** accompanying samples should be filled with **Patient name, Age, Gender, clinical information, clinicians** name and **contact number.**
- Never send a sample to the laboratory in a syringe and needle or in a syringe only.



Collecting Specimens at Home

- Patients must follow all instructions exactly for collection of specimens performed at home then brought to the laboratory for testing.
- Special containers with a powder or liquid preservative may be provided for urine collection. Patients should never empty or discard any powder or liquid from the container before beginning the collection of a specimen.
- Specimens should be delivered to the laboratory in the prescribed timeframe in order to assure accurate results.

Confirm the identity of every patient to ensure the right sample is collected from the right patient. Identify patient using any of the following

- Ask patient to state name and other identifiers such as date of birth.
- Assess ID cards to confirm the identity of patient

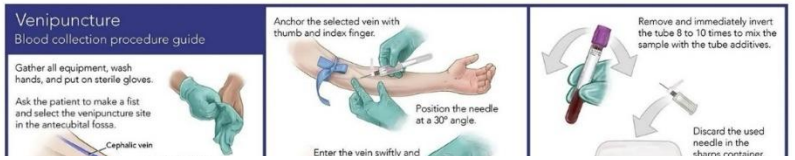
HANDWASHING

Follow appropriate infection Prevention and Control Protocols (IPC), such as handwashing, prior to and after collecting patient samples. May apply other hand hygiene protocols where appropriate.

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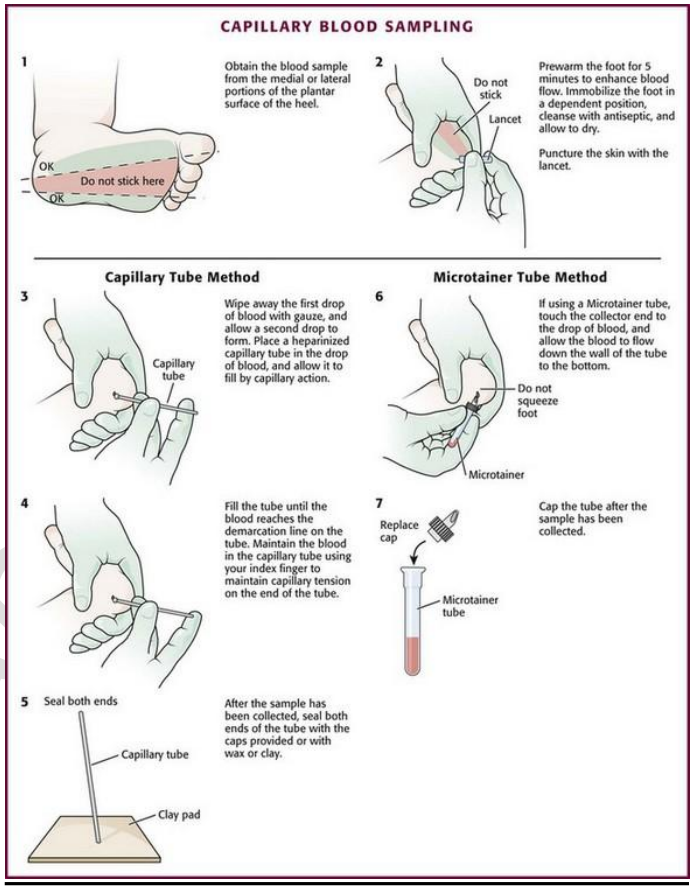




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ORDER OF DRAW	Cap Color		Use	Additive	Special Directions
First		Special	Blood culture	Culture media	Must draw first; Use sterile technique
		Clear (Discard tube)	Fill before filling blue-top tube when using butterfly set	None	Discard tube
		Light blue	Coagulation studies	Sodium citrate	Invert 3-4 times
		Red	Chemistry	No anticoagulant (glass), Silicon coating (palstic)	Do not invert (glass) Invert 5 times (plastic)
		Red/gray	Chemistry	Clot activatior, gel separator	Invert 5 times
		Gold (SST)	Chemistry	Gel separator, clot activator	Invert 5 times
		Green	Chemistry	Heparin	Invert 8 times
		Lavender	Hematology, hemoglobin A1c	EDTA	Invert 8 times
Last		Gray	Blood alcohol	Potassium oxalate, Sodium fluoride	Do not cleanse site with alcohol, Invert 8-10 times
		Gray	Glucose	Potassium oxalate, Sodium fluoride	Invert 8-10 times

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DOS AND DON'TS OF BLOOD COLLECTION

It is in the interest of all concerned to ensure that specimens are taken appropriately and delivered promptly to the laboratory; in particular, attention is drawn to the following to obtain valid results:

i. Always avoid prolonged stasis when taking blood.
ii. Always avoid contamination of the sample with IV fluids.
iii. Never mix blood from one specimen container with another.
iv. Always keep timed urine collections cool during the collection period.

It is of critical importance that Healthcare workers implement the guidelines for the proper collection, storage and transport of specimens. All diagnostic information is contingent on the quality of the specimen received.

DO	DON'T
DO carry out hand hygiene (use soap and water or alcohol rub), and wash carefully, including wrists and spaces between the fingers for at least 30 seconds	**DO NOT** forget to clean your hands
DO use one pair of non-sterile gloves per procedure or patient	**DO NOT** use the same pair of gloves for more than one patient
DO use a single-use device for blood sampling and drawing	**DO NOT** use a syringe, needle or lancet for more than one patient
DO disinfect the skin at the venepuncture site	**DO NOT** touch the puncture site after disinfecting it
DO discard the used device (a needle and syringe is a single unit) immediately into a robust sharps container	**DO NOT** leave an unprotected needle lying outside the sharps container
Where recapping of a needle is unavoidable, **DO** use the one-hand scoop technique	**DO NOT** recap a needle using both hands
DO seal the sharps container with a tamperproof lid	**DO NOT** overfill or decant a sharps container
DO place laboratory sample tubes in a sturdy rack before injecting into the rubber stopper	**DO NOT** inject into a laboratory tube while holding it with the other hand

Clean up spills of blood or body fluids

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If blood spillage has occurred (e.g. because of a laboratory sample breaking in the phlebotomy area or during transportation, or excessive bleeding during the procedure), clean it up.

An example of a safe procedure is given below.

- Put on gloves and a gown or apron if contamination or bleaching of a uniform is likely in a large spill. Mop up liquid from large spills using paper towels, and place them into the infectious waste. Remove as much blood as possible with wet cloths before disinfecting.
- Assess the surface to see whether it will be damaged by a bleach and water solution.
- For cement, metal and other surfaces that can tolerate a stronger bleach solution, flood the area with an approximately 5000 parts per million (ppm) solution of sodium hypochlorite (1:10 dilution of a 5.25% chlorine bleach to water).
- This is the preferred concentration for large spills. Leave the area wet for 10 minutes. Use blood spillage kit.
- For surfaces that may be corroded or discoloured by a strong bleach, clean carefully to remove all visible stains. Make a weaker solution and leave it in contact for a longer period of time. For example, an approximately 525 ppm solution (1:100 dilution of 5.25% bleach) is effective.
- Prepare bleach solution fresh daily and keep it in a closed container because it degrades over time and in contact with the sun.

SAMPLE ACCEPTANCE AND REJECTION CRITERIA

The laboratory makes every effort to ensure that samples are processed as requested. However samples must be appropriate for the requested investigation, the safety of laboratory staff must not be threatened and there must be no ambiguity as to the identification of the patient. The criteria for sample rejection, as described below, are strictly adhered to in the interest of patient safety. Failure to provide the required sample and data shall lead to rejection of the specimen and request form.

To safeguard quality test outcomes, specimen falling into any of the categories listed below will not be accepted by the laboratory for examination:

Measurement Uncertainty

Medical laboratories are responsible for ensuring that test results are fit for clinical application by defining analytical performance goals, selecting and qualifying appropriate measurement procedures. All measurement results have some inaccuracies due to analytical bias and imprecision; therefore a measurement result is an estimate at the time of undertaking such measurements. To properly use such results, medical laboratories and their clinical users need some knowledge of the

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accuracy of such estimates and the uncertainty it may have on the interpretation of patient results.

This estimate of such uncertainties is referred to as Measurement Uncertainty (MU) which incorporates the cumulative range of factors involved in the examination procedure, which may potentially influence the overall test result and thus the interpretation of patient results. The complete result of a measurement is a value, a unit and an estimate of uncertainty. Medical laboratories consider the impact of such uncertainties on the interpretation of patient results and ensure uncertainties are minimized through control measures such as standardized procedures, Internal Quality Control monitoring and trending and routine evaluation of MU.

Evaluating measurement uncertainty is an ISO 15189:2022 accreditation requirement. It should be noted that all assays within our laboratory use standard operating procedures followed by trained and competency assessed scientists. The MU is initially estimated for each assay during the qualification of the selected examination procedure and is evaluated against the pre-defined maximum allowable measurement uncertainty.

Each MU is then re-estimated at regular intervals with additional data and reviewed against the pre-defined maximum allowable measurement uncertainty to ensure uncertainty values and therefore errors and inaccuracies are minimized Overall assay performance is also regularly monitored through internal quality control (IQC) and external quality assessment (EQA) schemes and incorporated in test result interpretation. MU for individual assays is available upon request.

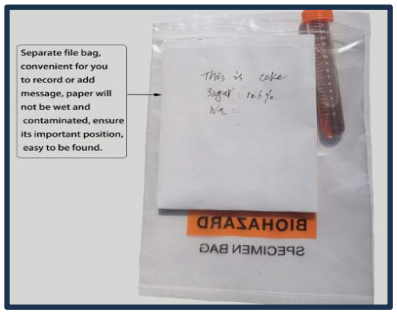
Sample packaging

The specimen must be:

- placed in the appropriate container for purposes of transport [specify what type of containment (secondary container) is used for specimen transportation in your facility]
- packaged carefully to avoid breakage of the specimen container (primary) or leakage of the specimen.
- placed in the appropriate compartment of the specimen plastic bags provided.

In situations where multiple secondary containers are to be transported package samples into a tertiary container. The tertiary container must be leak proof, puncture resistant, sturdy and sterile.

The request form and the sample should never be placed in direct contact with each other to avoid contamination in the unlikely event of sample spillage.





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Sample Rejection criteria

a. Unlabeled specimen b. Improperly labeled specimens (e.g. illegible name and ID) c. Improperly collected specimen (as defined in this handbook). d. Improperly transported specimen (specimen transported with exposure) e. Improperly completed test requisition f. Specimen showing gross evidence of contamination. g. Situations that make the identity of the sample or the validity of the results obtained unreliable. h. Specimen that has leaked or have specimen on the outside of the container (except for irreplaceable specimens such as CSF, surgical specimens, etc. These will be accepted, and leakage indicated in reporting).	i. Insufficient specimen for the tests requested. j. Absence of diagnosis/clinical history k. Specimen for culture, coagulation and urinalysis arriving in the Laboratory after the allowable duration of transport to the laboratory). l. Specimen arriving without ice or above 8^0 C are rejected unless otherwise specified by the laboratory. Haemolyzed specimen (testing interference, inaccurate results). m. Uncovered; exposed to air n. Received past recommended time; not separated prior to transport after prolonged storage.

STAFF MEDICARE

The hospitals' implementation of the Medicare Service accords Staff of the hospital the privilege to have bills paid for laboratory services refunded to them. Staff are to come alongside the request form, their valid staff ID and NHIS card, benefit from this service.

CHEM. PATH. DEPT

For blood

- **PLAIN BOTTLE WITH GEL (GOLD TOP)/ LITHIUM HEPARINIZED TUBE (GREEN TOP)** is required for **MOST ROUTINE ASSAYS** carried out by this section of the lab.
- **BLOOD GLUCOSE TEST** requires **FLUORIDE OXALATE TUBE (GRAY TOP)**.

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- **BLOOD for GLYCATED HAEMOGLOBIN(HBA1C)** requires an **EDTA TUBE (PURPLE TOP)**

In the event that a different tube is introduced; the wards will be appropriately communicated to.

Do not apply a tourniquet when drawing blood for CALCIUM analysis

- **OGTT**
  This test is a provocation test to examine the efficiency of the body to metabolise glucose

Preparation of the Patient

- At least three days of unrestricted, carbohydrate rich diet (≥150g of carbohydrates daily)
- Unrestricted physical activity prior to day of test.
- As much as possible, there should be no medication on the day of the test. If medication cannot be avoided, then it must be recorded.
- 8-14 hours overnight fast prior to the test, during which water may be drunk.
- No smoking is allowed prior to and during the test.

  NOTE
  The OGTT is affected by metabolic stress from a number of clinical conditions. These include

- Major surgery
- Myocardial infarction, stroke, infections etc.

  Other factors affecting OGTT are

- Rate of absorption for e.g. Malabsorption
- Rate at which glucose is cleared from the blood
- Drugs (steroids, thiazides, phenytoin, oestrogens, thyroxine)
- Stress e.g. (patient on admission)
- nausea
- Caffeine, smoking

Blood for analysing **SB (Serum Bilirubin)** should be **wrapped with paper** to reduce exposure to light and sent immediately to the lab.

24 hour urine sample test instructions are available at the front desk of the lab, however they are briefly reproduced below:

24-HOUR URINE COLLECTION PROCEDURE

The first urine passed in the morning is discarded. All subsequent urine for the next 24 hours is collected into the receptacle. On rising the next morning the patient empties the bladder again, 24 hours after the first specimen, and this final specimen is added to the bottle. Collection from 08:00 is recommended and the bottle should preferably be kept cool (refrigerated if possible).

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The laboratory however does not provide urine containers for 24-hour urine test. The client is expected to bring along a clean plastic container with a secured lid large enough to contain urine collected over a 24 hour period for the preservative.

Since some receptacles may contain corrosive materials patients must always be advised to avoid skin contact and splashes while using the receptacles and that on no account should any liquid in the bottle be tipped out of the bottle before use.

CEREBROSPINAL FLUID (CSF)

CSF for **GLUCOSE ANALYSIS** is required in **FLUORIDE OXALATE BOTTLE (GRAY TOP).**

TESTS	**TUBE**	**SAMPLE VOL**
BLOOD GLUCOSE	Fluoride oxalate(gray top)	*2mL-4 mL
CSF	Fluoride oxalate(gray top)	≤1 mL
GENERAL CHEMISTRY	Plain(gold top)/heparin tube(green top)	*2mL -5 mL
HBA1C	EDTA tube(purple top)	2mL -5 Ml

*Provisions are made for paediatric samples

HAEMATOLOGY DEPT.

EDTA TUBE (PURPLE TOP) is required for **FBC, BF, Hb, BLOOD FILM FOR COMMENTS, SICKLING, Hb ELECTROPHORESIS** tests.

HEPARIN TUBE (GREEN TOP) is required for **G-6PD**.

SODIUM CITRATE TUBE (BLUE TOP) is required for **COAGULATION TESTS** and blood should be **1.8mL** in volume**.**

TESTS	TUBE	SAMPLE VOL
FBC	**EDTA TUBE (PURPLE TOP)**	**≥1mL**
ESR	**EDTA TUBE (PURPLE TOP)**	**≥2mL**
SICKLING, BF	**EDTA TUBE (PURPLE TOP)**	**≥1 mL**
BLOOD FILM COMMENT	**EDTA TUBE (PURPLE TOP)**	**≥1 mL**
Hb ELECTROPHORESIS	**EDTA TUBE (PURPLE TOP)**	**≥ 1mL**
G-6PD	**HEPARIN TUBE (GREEN TOP)**	**3mL**
COAGULATION	**SODIUM CITRATE TUBE (BLUE TOP)**	**1.8mL**

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BLOOD is required in an **EDTA TUBE (PURPLE TOP) for TROPHOZOITE COUNT. Blood can be sampled at any time.**

PARASITOLOGY UNIT

BLOOD is required in an **EDTA TUBE (PURPLE TOP)** for **MICROFILARIA TESTS**. The sample should be taken between the hours of 22:00 and 2:00.

URINE receptacles (containers) for Routine Examination and special tests are obtained directly from the reception/front desk at all hours in the lab. Urine required should be at least 20 mL in volume. Urine specimen should reach the lab within an hour of collection

STOOL containers for routine examination can be obtained directly from the reception/front desk at all hours in the lab. A spatula full of stool is required for the tests. Stool specimen should reach the lab within an hour of collection

STOOL FOR OCCULT BLOOD.
Please adhere to the following instructions.
Patient should abstain from the following foods and drugs for 3 days before producing stool sample. Green vegetables, beans, folic acid, blood tonic, red meat, fresh fish

SWAB STICKS: Sterile swabs can be obtained at the front desk of the central lab. Dry swabs would not be accepted.

SKIN SNIP: Patient should present to the laboratory on the day of testing. No preliminary preparation is required.

BACTERIOLOGY UNIT

BLOOD for **CULTURE AND SENSITIVITY (C/S)** should be put into

- **PAEDIC PLUS BOTTLE (PINK TOP)** FOR PATIENTS/CLIENTS **12 YEARS AND BELOW**;
- **AEROBIC AND ANAEROBIC BOTTLES (ASH AND ORANGE TOPS)** FOR PATIENTS/CLIENTS **ABOVE 12 YEARS**.
- For clients with **ANY SUSPICION OF IMMUNOSUPPRESSION**, blood should be put in the **AEROBIC, ANAEROBIC** and **MYCOTIC BOTTLES**(Ash, Orange, and Lime green tops) respectively.

URINE
Receptacles for culture and sensitivity tests can be obtained from the reception of the lab. **Midstream specimen** is required. Where **suprapubic tap**is used to obtain urine, it should be stated clearly on the request form. **Urine specimen should reach the lab within an hour of collection.**

STOOL
Containers for culture and sensitivity tests can be obtained directly from the reception/front desk at all hours in the lab. A **SPATULA FULL** of stool is required for the tests. **Stool specimen should reach the lab within an hour of collection.**

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SKIN SCRAPPING
Patients would be directed from the reception/front desk to the appropriate lab for an appointment and instructions regarding the test.

OTHER FLUIDS
Sterile universal containers of appropriate size are available at the front desk of the lab for aspirates and fluids which require culture and sensitivity tests. Such samples are not acceptable in syringes.

CEREBROSPINAL FLUID (CSF):
Sterile Universal Containers of an appropriate size are preferred and available at the front desk of the lab for the collection of CSF for cell count and or culture and sensitivity test

SPUTUM
Sterile containers are available at the front desk of the lab. Sputum is required and not saliva

Sputum Specimen containers are available from the Chest Clinic Laboratory. Sputum samples are submitted for microbiology from patients with a chest infection. The container should be labelled with the your full name, date / time of collection and the sample type, i.e. Sputum.

1. To collect the sample, Gargle and rinse mouth with tap water to remove food particles and debris. DO NOT use mouthwash or brush teeth with toothpaste immediately before collection.
2. Open the container and hold very close to mouth.
3. Take as deep a breath as possible and cough deeply from within the chest. DO NOT spit saliva into the container. Saliva is not a suitable specimen for examination. The specimen should look thick and be yellow or green in colour. There may be fluid with some green or yellow material.
4. Avoid contaminating the outside of the container. Close the lid tightly when specimen has been obtained.
5. Place specimen in plastic bag section of request form and seal bag.
6. Bring the container and form to the laboratory as soon as possible.
7. If there is unavoidable delay in transporting the specimen to Laboratory, it may be stored in a refrigerator prior to transportation. Prolonged delays will affect test results.
8. All sputum specimens should be transported to the laboratory in tightly capped containers placed in the plastic bag (attached to the form).
9. This should ideally then be placed in another leak-proof container before transport to the laboratory.
10. Specimens for TB testing: Two specimens are usually required on the spot. The ideal time to collect the specimens is early in the morning just after getting out of bed. Collect and transport all specimens as described above.

IMMUNOLOGY AND CELL BIOLOGY UNIT.

- **PLAIN BOTTLE WITH GEL (GOLD TOP)** is required for **MOST ROUTINE ASSAYS** carried out by this section of the lab
- **HIV VIRAL LOAD** requires **EDTA TUBE (PURPLE TOP)**.

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- **Early infant diagnosis and HIV Confirmation: Quantitative HIV PCR requires DBS or EDTA TUBE (PURPLE TOP)**

In the event that a different tube is introduced; the wards will be appropriately communicated to.

SEMEN FOR ANALYSIS

Samples are received at the lab between the hours of 8am and 12 noon on Mondays, Wednesdays and Fridays only. Samples should be received within one hour of sample production. Patient should have abstained from sex for at least 3 days and at most 7 days prior to producing specimen. During the period of abstinence, patient should neither drink alcohol nor smoke. **Masturbation is the recommended method for producing the specimen**.

Tests	Tube	Sample Vol.
General Serology	Plain tube with gel(Gold Top)	3mL blood
CD4/CD8 count	EDTA Tube(Purple Top)	3mL blood
Urine Pregnancy Test	Clean container	10mL urine
*** Viral load(HBV/HIV)**	EDTA Tube(Purple Top)	3mL blood
Early Infant Diagnosis (EID) of HIV	Dried blood spots	

ORDER- OF-DRAW FOR MULTIPLE BLOOD COLLECTION

The following order-of-draw, which is recommended when drawing several specimens during a single venepuncture, is based on pragmatism. Its purpose is to avoid possible test result error due to cross contamination from tube additives. This procedure should be followed for both evacuated tubes, and syringe transfer of blood to multiple tubes.

A. **BLOOD CULTURE OR BLOOD CULTURE BOTTLE** (rotate tube 8-10 times)

B. **COAGULATION TUBE (BLUE TOP**) (rotate tube 3-4 times)

C. Other Additive and non-additive tubes:

- **GEL SEPARATOR or CLOT ACTIVATOR TUBE (GOLD TOP WITH GEL**) (rotate tube 8-10 times)
- **HEPARIN TUBE(GREEN TOP)**(rotate tube 8-10 times)
- **EDTA TUBE (PURPLE TOP)**(rotate tube 8-10 times)
- **FLUORIDE-OXALATE TUBE(GRAY TOP)**(rotate tube 8-10 times)

D. For syringe draws, the order of draw is the same, except the Blood Culture bottle or tube is always sampled first, and if two

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syringes are used in the draw, the Coagulation bottle (blue top) must be sampled from the 2nd syringe.

SPECIFIC REQUIREMENTS FOR EARLY INFANT DRIED BLOOD SPOT (DBS) COLLECTION (PCR for DBS)

(i) When to collect

Blood can be collected any day any time and the DBS delivered to the laboratory for testing.

(ii) What is needed for DBS

Supplies required for blood collection using DBS:

- Powder free gloves
- DBS cards
- 2mm lancets
- 70% ethanol /methylated spirit
- Gauze or cotton wool
- Weighing paper
- Sealable plastic bags
- Desiccant packets
- Drying racks
- Laboratory request forms
- envelopes
- fine tip permanent markers

(iii)How to collect the blood on DBS card

1. Complete the lab form
2. Label the DBS card with baby's name and age, date of collection and facility name**. D**o not touch the circle on the card with anything other than the infant's blood. Your hands, glove powder, ink or dirt would affect the result.
3. Observe standard precautions.
4. Have the mother sit comfortably holding the baby.
5. Choose the spot where you will prick.
    a. **Small infants up to about the age of 4 months up to 5 Kgs- prick the heel.** The best area is the lateral section of the heel. Do not prick the back of the heel where the bone is. See figures 6.1 and 6.2.

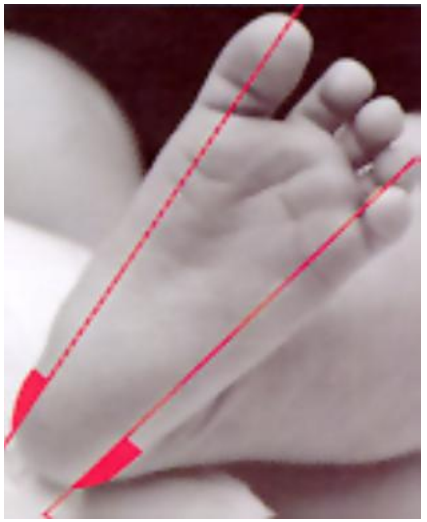


Figure 6.1 Lateral side of heel to be pricked

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Figure 6.2 Pricking the heel of an infant

b. **Larger infants between 4 and 3months old or more than 5 Kg- prick the big toe.** Lateral side or outside part of the big toe works best. Do not prick the very end of the toe where the bone is close to the skin.
c. **Older infants over 10 months or more than 10 Kg -prick the finger.** The best finger is the ring finger on the left hand as this finger will be the least used by the baby. Select the **lateral side of the finger tip.** Do not prick the very end of the finger where the bone is close to the skin. The thumb is not recommended because it would be the most painful.

6. Warm the area you will prick, especially if the infant is cold. The mother can hold the baby's foot or hand in her hand. Rubbing it gently may help. A cloth or nappy soaked in warm water can be used- keep on for 3 minutes.
7. Wash hands. Put on powder free gloves. If powdered gloves are used rinse hands a second time to get the powder off.
8. Let the mother or care giver hold the baby in an upright position against her chest. The babies' foot or hand should be below the level of baby's heart so blood will flow more easily.
9. Clean the area you prick with 70% ethanol or methylated spirit and let dry for 30 seconds to kill skin microbes.
10. Prick the infant's heel, toe or finger with a sterile 2mm lancet safely without damaging bone. Do not use a needle or scalpel or longer lancet.
11. Wipe away the first drop of blood with dry cotton wool, and allow a large drop to form on the puncture site.
12. Touch the DBS card gently against the large drop and allow it to completely fill a circle on the paper on the side with the printing. <u>The first drop should fill the circle.</u> Do not press the paper against the heel toe or finger. Do not apply blood more than once in the same circle. See figure 6.3.



Figure 6.3 Filling the circle on the DBS card

13. Fill <u>all</u> circles. Three valid circles are needed by the lab.
14. If there is not enough blood, gently squeeze and release or apply gentle pressure to the whole lower leg and foot,

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the whole hand, depending where the prick is. The area directly around the puncture should not be squeezed or "milked" as you would get tissue fluid instead of blood and the lab will not be able to test it. It may be necessary to puncture the same site or another suitable location to complete the collection.

15. When the circles have been filled, clean the puncture site and press cotton wool against it until it stops bleeding. Do not use bandage. Figure 6.4 and table 6.1 shows valid and invalid DBS specimens respectively.



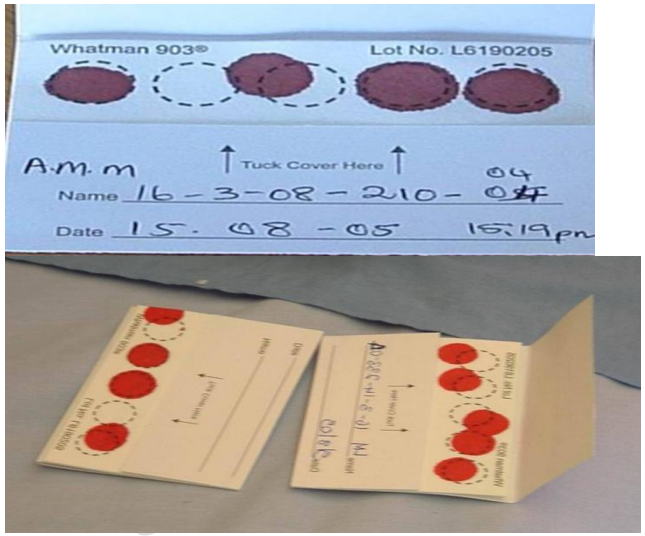
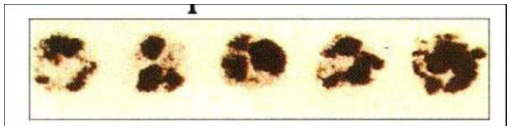


Figure 6.4 Valid DBS sample

Problem	Possible causes
Not enough blood for testing 	**Removing filter paper before blood had filled circle** **The filter paper coming in contact with gloved or ungloved hands or substances such as lotion of powder before or after**

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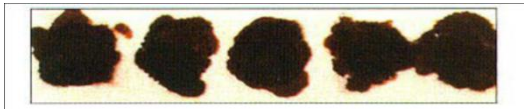
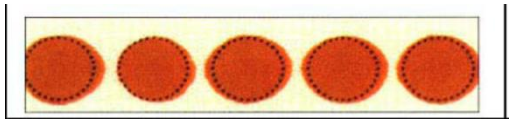
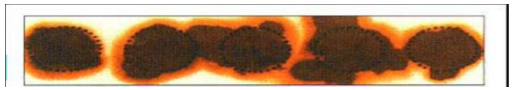
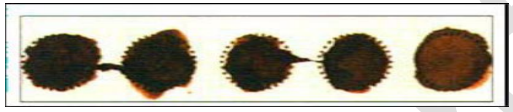
	specimen collection
Specimen appears scratched or abraded 	**Applying blood with a capillary tube or other device**
Specimen is bright red 	**Specimen was not dried before mailing** **DBS must be dried a minimum of 3 hours before packaging and shipping**
specimen is too saturated 	**Both sides of the card were soaked** **Blood may have been applied with a syringe**
Specimen appears clotted or layered 	**Layering one blood spot on top of another** **Fill circle on both sides of paper**

Table 6.1 Invalid DBS samples

(iv) How to dry DBS (see figure 6.5)

1. Once the blood spots have been collected, they need to dry completely before sending them to the lab. Do not touch or smear the spots.
2. Leave specimen cards on a flat surface or a drying rack for at least 3 hours without stacking them. Do not leave them in the sun. Protect them from rodents, insects and dust.
3. Do not allow blood spots to come into contact with any surface or with each other.
4. **If possible send dry specimens to the lab the same day.**
5. **If unable to send specimens the same day,** leave them to dry on the rack overnight.

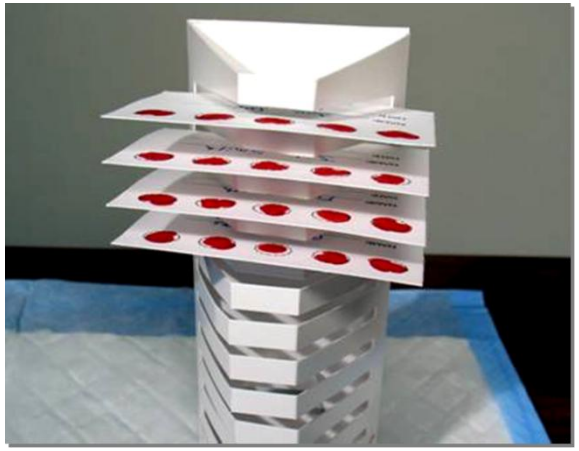


Figure 6.5 Drying DBS specimens

(v) How to pack and send DBS to laboratory

1. After the DBS is dry:
    - Put DBS cards in sealable plastic bag

central lab service

- Add one desiccant pack per DBS card
- If DBS card is exposed type, then wrap each with a sheet of weighing paper.

2. Up to 10 DBS samples can be put into one bag.
3. Ensure that each specimen is accompanied by a duly completed lab form.
4. Place the plastic bag of DBS, the lab forms, and the specimen delivery checklist into a larger paper envelop.
5. Label the envelope as follows:
    - **"**Infant DBS Specimens"
    - Facility name
    - District
    - Date of dispatch

DISCLAIMER

The lab reserves the right to discard any specimen incorrectly collected. The lab does not provide specimen containers to be used for tests by other labs. Where request forms are incorrectly or illegibly completed, the laboratory reserves the right to reject such requests. Unlabelled or mislabelled samples will not be accepted.

REQUESTS FOR LAB INVESTIGATIONS

REQUEST FORMS and CLINICAL INFORMATION

One general request form with sections for each of the four departments is available for use. For easy identification, each department's section is colour coded: Red for Haematology, Blue for Chemical Pathology, Green for Microbiology and Yellow for Immunology. In all cases the form must be correctly and legibly completed with patient **NAME, AGE, GENDER, , WARD, DIAGNOSIS, SAMPLE SOURCE, TIME OF SAMPLE COLLECTION, ANY OTHER RELEVANT CLINICAL COMMENTS and REQUESTING DOCTOR'S NAME, CONTACT, SIGNATURE** and **DATE.** Tests required should be clearly indicated by ticking the appropriate box and where any test is not listed it should be clearly written on the request form.

Where all information is provided appropriately the speed of processing of request and the results of the tests are influenced positively, leading to a more rapid turnaround of report. Also it will allow the department to correctly interpret results and provide follow-up tests where appropriate.

REQUEST ON LHIMS

A clinician can request a laboratory test on the LHIMS for a client, with the client's unique identification number. This test recommendation can be assessed by the billing unit at the laboratory and converted into appointment for processing. In this way, the client does not have to come with a request form.

PHLEBOTOMY SERVICE

Phlebotomy services are available at the Central Laboratory for all clients who walk in for care. For the convenience of our clients, who attend outpatient clinics or on admission at the various departments' phlebotomy services are currently available at the Child Health department, Fevers Unit, and Obstetrics and Gynaecology department, (Blood bank, OPD & Emergency, NICU), Diabetic Clinic, PICU and the Accident and Emergency unit of the hospital. The last four facilities above are usually open Mondays to Fridays between the hours of 08:00 and 16:30.

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PAYMENTS

Central Laboratory DOES NOT OFFER FREE SERVICES. All tests requested for must be paid for either with the National Health Insurance Scheme, any other Health Insurance scheme who have subscribed with the Hospital or by upfront payment. Clients should always demand receipts when payments for services are made. These payments must be done at the designated points before specimen bottles are given out. It is the responsibility of in-patients/relations to demand receipts of all payments made on their behalf by lab attendants. In the event where receipts are not given, a formal complaint can be made to the laboratory officer/CSO.

DISCLAIMER

The Laboratory does NOT BEAR ANY RESPONSIBILITY for payments not made at the designated cash points by out-patients and in-patients/clients WHO WALK INTO the Central lab.

SUBMISSION OF SAMPLES

Samples are to be submitted alongside the request form, at the sample reception point of the Central lab. At no point should the samples be sent without passing through the reception. In the event that a sample gets into the lab without passing through the reception the Central Lab will not be held responsible for any outcome of the sample.

CRITERIA FOR SAMPLE REJECTION.

Samples received at the front desk of the lab will be rejected if they fall into the following criteria

1. Generally for all samples with **LABELLING ERRORS** as follows:

- Unlabelled specimen
- Labelling on specimen and requisition do not tally

2. Generally for **ALL UNSATISFACTORY SAMPLES** as follows:

- Urine specimen longer than two-hour lapse before refrigerating or culturing
- Blood specimen of insufficient volume for ESR test (<2mls)
- Semen samples older than one hour
- Whole blood specimens containing clots
- Blood specimens older than 24 hours for haematology tests
- Blood for FBC, BF, Hb, trophozoite count, Blood Film for comments, Sickling, Hb electrophoresis tests in tubes other than EDTA anticoagulant
- Any dry swab received
- Saliva received instead of sputum
- Obvious mouth wash or food contamination in sputum
- Insufficient quantity or dried specimen for C/S received
- Blood for G-6PD test in tube other than Heparin tube (Green Top
- Blood for Coagulation tests in tube other than Sodium Citrate tube (Blue Top)

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- Blood volume below or above the indicated (marked) volume for coagulation test.
- Samples for culture and sensitivity testing in non-sterile containers
- Samples from patient under 6 months of age for sickling tests
- Non fasting blood samples for fasting tests
- Grossly haemolysed samples
- Blood exposed to light for more than 2 hours for the estimation of bilirubin
- Lipaemic samples as it affects enzymes, electrolytes (Na+) total protein and bilirubin estimation
- Icteric samples as it interferes with assays near the bilirubin absorbance peak

3. Generally for **ALL REQUISITION INADEQUACIES** as follows:

- Time of collection not noted on requisition
- Improperly filled or incompletely filled requisition

4. Generally for **ALL SAMPLES WITH HAZARDOUS HANDLING CONDITIONS** as follows

- Any liquid specimen exhibiting container contamination/spillage
- Specimen in syringe only or both syringe and needle
- Specimens submitted in cracked or leaking containers with external contamination of blood/body fluids.

When specimens are rejected, a sample rejection form which indicates the reason for the rejection will be sent to the requesting clinician and a new specimen would be required.

When mislabelled or unlabelled irreplaceable specimens such as CSF and certain microbiological specimens are received, the requesting clinician or other approved personnel would have to come to the laboratory to positively identify the specimen, affix the proper label, and complete an unlabelled / mislabelled specimen documentation form.

Also when a physician requires that a procedure be performed on unsatisfactory specimen, s/he will be required to do so in writing. The condition of the specimen will also be noted in the report he will be given.

Please refer to the appendix for a sample of the laboratory rejection form and mislabelled/unlabelled specimen documentation form.

REPORT COLLECTION

Reports are collected at the designated collection point by using the receipts given when payments were made. Days and times for collecting reports are communicated to the client when the samples are received.

LABORATORY ATTENDANTS

In some designated wards laboratory attendants are attached. Their duties include the dispatch of samples and requests from the wards to the main laboratory and results/reports from the main laboratory to the wards. The attendants' duties include transporting blood and blood products to and from the blood bank. Some attendants double as phlebotomist. Their assistance maybe sought when needed. However, the responsibility of their

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actions or inactions in the line of duty lies squarely on the shoulders of the requesting clinician.

TURN AROUND TIMES (TAT)

This indicates how long it will take the lab to run tests and release results; thus from the time sample is received by the laboratory to the time results are ready to be released.

HAEMATOLOGY (TAT)

TEST	TAT
APPT	4-24 HOURS
BF	4-24 HOURS
BLOOD FILM COMMENT	≤3 DAYS
BONE MARROW ASPIRATE	≥ 1 WEEK
FACTOR IX	4-24 HOURS
FACTOR VIII	4-24 HOURS
FBC	3 HOURS
G-6PD	4-24 HOURS
Hb ELECTROPHORESIS	4-24 HOURS
PT(INR)	4-24 HOURS
SICKLING	3 HOURS
D-DIMER	4-24 HOURS
FIBRINOGEN	4-24 HOURS
PROTEIN C	4-24 HOURS
PROTEIN S	4-24 HOURS
BODY FLUID CELL COUNT	4-24 HOURS

CHEMICAL PATHOLOGY (TAT)

TEST	TAT
BJ PROTEIN	24 HOURS
BUE & Cr	24 HOURS
CALCIUM,MG,PHOS	24 HOURS
CARDIAC ENZYME	24 HOURS
CSF BIOCHEM	24 HOURS
FBG	24 HOURS
HORMONES/TUMOUR MARKERS	24 HOURS
LFT	24 HOURS
LIPID	24 HOURS

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OGTT	24 HOURS
URIC ACID	24 HOURS
B-HCG	24 HOURS
***STAT CASES**	1 HOUR

IMMUNOLOGY (TAT)

TEST	TAT
ANA	24 DAYS
ASO/CRP	24 HOURS
CMV,RUBELLA,TORCHS,CHLAMYDIA	24 HOURS
H. pylori	24 HOURS
HBsAg	24 HOURS
HCV	24 HOURS
HEPATITIS B PROFILE	24 HOURS
RHEUMATOID F.	24 HOURS
SEMEN ANALYSIS	24 HOURS
TOXOPLASMA(IgG)	24 HOURS
VIRAL LOAD (HIV/HBV)	14 DAYS
Early Infant Diagnosis (EID) for HIV	14 DAYS
URINE PT	24 HOUR
VDRL/T.P ANTIBODIES	24 HOURS
WIDAL	24 HOURS

MICROBIOLOGY (TAT)

TEST	TURN AROUND TIME(TAT)
BLOOD C/S	UP TO THE 5TH DAY
CSF C/S	3 DAYS
CSF CELL COUNT/GRAM STAIN	1HOUR
MISCELLANOUS C/S	3RD DAY AFTER RECEIVING SAMPLE
MISCELLANOUS R/E	24 HOURS
STOOL C/S	AFTER THE 4TH DAY
STOOL R/E	24 HOURS

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URINE C/S	AFTER THE 3RD DAY
URINE R/E	24 HOURS

SAMPLE TRANSPORTATION REQUIREMENTS

DESCIPLINE	**TEMPERATURE**	**SPECIAL REQUIRMENTS**
CLINICAL CHEMISTRY	2-8^{O}C	See special requirements for specific sample types under clinical chemistry section
HAEMATOLOGY	2-8^{O}C	See special requirements for specific sample types under haematology section
IMMUNOLOGY	2-8^{O}C	See requirements for EID under immunology department
MICROBIOLOGY	Transport room temperature	See special requirements for specific sample types under microbiology section

TESTS AVAILABLE IN CHEMICAL PATHOLOGY DEPT.

- 2HPP BLOOD GLUCOSE
- ALBUMIN
- ALKALINE PHOSPHATASE
- ALT
- AMYLASE
- ASCITIC FLUID BIOCHEM
- AST
- BUE
- BUE+CREATININE
- BUN
- C- REACTIVE PROTEIN
- CA-125
- CALCIUM
- CARDIAC ENZYMES
- CEA
- CHLORIDE

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- CORTISOL
- CREATININE
- CREATININE CLEARANCE
- CREATINE KINASE
- CSF-BIOCHEMISTRY
- DIRECT BIL.
- ESTROGEN
- FASTING BLOOD GLUCOSE(FBG)
- FERRITIN
- FSH
- FT3
- FT4
- HDL-CHOLESTEROL
- LDH
- LDL
- LFT
- LH
- LIPID PROFILE (CHOL, TRI, HDL, LDL)
- MAGNESIUM
- OGTT
- PHOSPHATES
- PLEURAL ASPIRATE FOR BIOCHEM
- PROGESTERONE
- PROLACTIN
- RANDOM BLOOD GLUCOSE
- SERUM BILIRUBIN
- SODIUM
- TESTOSTERONE
- TSH
- TOTAL BILIRUBIN
- TOTAL CHOLESTROL
- TOTAL PROTEIN
- TOTAL SERUM β-HCG
- TPSA
- TRIGLYCERIDE
- TROPONIN I
- URIC ACID
- URINE FOR BJPROT.
- α – FETOPROTEIN

TESTS AVAILABLE IN THE IMMUNOLOGY DEPT.

- ANA(ANTI-NUCLEAR ANTIBODIES)
- ASO TITRE
- C- REACTIVE PROTEIN
- CD4/CD8
- CHLAMYDIA TRACOMATIS
- CMV – IgG
- CMV – IgM
- CSF FOR TOXOPLASMOSIS
- Early Infant Diagnosis (EID) for HIV
- H. PYLORI
- HBsAg
- HCV
- HEPATITIS B PROFILE TITRE
- HEPATITIS PROFILE
- INFECTIOUS MONO.(IM)
- KARYOTYPE (Y- TEST)
- PREGNANCY TEST/ PREGNOSTICON
- RHEUMATOID FACTOR
- RUBELLA – IgG
- RUBELLA – IgM
- SEMEN ANALYSIS
- T.P ANTIBODIES

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- TORC TEST
- TORCHS TEST
- TOXOPLASMA (IgM SERUM)
- VDRL (TPHA)
- VIRAL LOAD (HIV/HBV)
- WIDAL TEST

TESTS AVAILABLE IN THE MICROBIOLOGY DEPT.

- ASCITIC FLUID C/S
- ASPIRATES C/S
- BLOOD C/S
- BONE MARROW C/S
- CATHETER TIP C/S
- CORD SWAB C/S
- CORNEAL SCRAPPING C/S
- CSF BACTERIOLOGY
- EAR SWAB C/S
- ENDOCERVICAL SWAB
- EYE SWAB
- HVS C/S
- HVS R/E
- MICROFILARIA
- MISCELLANEOUS C/S
- NASAL SWAB C/S FOR SCREENING FOR MRSA
- HAND SWAB C/S
- PLEURAL FLUID C/S
- SEMEN C/S
- SKIN SCRAPPING
- SKIN SLIT
- SKIN SNIP
- SPUTUM C/S
- STOOL C/S
- STOOL OCCULT BLOOD
- STOOL R/E
- SYNOVIAL FLUID C/S
- THROAT SWAB C/S
- TROPHOZOITE COUNT
- URETHRAL SMEAR
- URINE BILE PIGMENTS/SALT
- URINE C/S
- URINE R/E
- URINE REDUCING SUBSTANCE
- WOUND SWAB C/S

TESTS AVAILABLE IN THE HAEMATOLOGY DEPT.

- APTT
- BLOOD FILM (MALARIA PARASITES)
- BLOOD FILM COMMENT
- BONE MARROW ASP
- BONE MARROW ASP (PAEDICS)
- CLOTTING PROFILE
- D-DIMER
- ESR
- Factor assay (FVIII & FIX)
- FBC
- FDPS
- Fibrinogen (Fbg)
- G6PD
- Hb
- Hb ELECTROPHORESIS
- Protein C
- Protein S
- PT (INR)
- RETICULOCYTE COUNT

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- SICKLING
- VWFS: Ag

APPENDIX A (DAILY ANALYSIS)

- 2HPP BLOOD SUGAR
- ALBUMIN
- ALKALINE PHOSPHATASE
- ALT
- AMYLASE
- APTT
- ASCITIC FLUID BIOCHEM
- ASCITIC FLUID C/S
- ASO TITRE
- ASPIRATES C/S
- AST
- BF (MPS)
- BLOOD C/S
- BUE
- BUE+CREATININE
- BUN
- C- REACTIVE PROTEIN
- CALCIUM
- CARDIAC MARKERS
- CATHETER TIP (IV ONLY) C/S
- CHLAMYDIA trachomatis
- CHLORIDE
- CLOTTING PROFILE
- CORD SWAB C/S
- CORNEAL SCRAPING C/S
- CREATINE KINASE
- CREATININE
- CREATININE CLEARANCE
- CSF BACTERIOLOGY
- CSF-BIOCHEMISTRY
- DIRECT BIL.
- EAR SWAB C/S
- ENDOCERVICAL SWAB C/S
- ESR
- EYE SWAB C/S
- FASTING BLOOD GLUCOSE
- FBC
- G6PD
- H. pylori
- HAND SWAB C/S FOR FOOD HANDLERS
- Hb
- HbsAg
- HCV
- HDL-CHOLESTEROL
- HEPATITIS PROFILE
- HVS C/S
- HVS R/E
- LDH
- LDL
- LFT
- LIPID PROFILE (CHOL,TRI, HDL,LDL)
- MAGNESIUM
- MICROFILARIA
- NASAL SWAB C/S FOR SCREENING MRSA
- OGTT
- PHOSPHATES
- PLEURAL ASPIRATES BIOCHEM
- PLEURAL FLUID C/S
- PREGNANCY TEST/ PREGNOSTICON

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- PT (INR)
- RANDOM BLOOD SUGAR
- RETICULOCYTE COUNT
- RHEUMATOID FACTOR
- SEMEN ANALYSIS
- SEMEN C/S
- SERUM BILIRUBIN
- SICKLING
- SKIN SCRAPING
- SKIN SLIT
- SKIN SNIP
- SODIUM
- SPUTUM C/S
- STOOL C/S
- STOOL OCCULT BLOOD
- STOOL R/E
- SYNOVIAL FLUID C/S
- T.P ANTIBODIES
- THROAT SWAB C/S
- TOTAL BILIRUBIN
- TOTAL CHOLESTROL
- TOTAL PROTEIN
- TOXOPLASMA (IgG SERUM)
- TRIGLYCERIDE
- TROPHOZOITE COUNT
- URETHRAL SMEAR
- URIC ACID
- URINE FOR BJPROT.
- URINE R/E
- URINE REDUCING SUBSTANCE
- VDRL(TPHA)
- WIDAL TEST
- WOUND SWAB C/S

APPENDIX B (BATCH-WISE ANALYSIS)

- ANA (ANTI-NUCLEAR ANTIBODIES)
- BLOOD FILM COMMENT
- BONE MARROW ASP (ADULT)
- BONE MARROW ASP (PAEDICS)
- BONE MARROW C/S
- CA-125
- CD4/CD8
- CEA
- CMV – IgG
- CMV – IgM
- CSF FOR TOXOPLASMOSIS
- DNA PATERNITY
- ESTROGEN
- FERRITIN
- FSH
- FT3
- FT4
- Hb ELECTROPHORESIS
- HEPATITIS B PROFILE TITRE
- INFECTIOUS MONONUCLEOSIS (IM)
- KARYOTYPE (Y- TEST)
- LE CELLS TEST
- PROGESTERONE
- RUBELLA – IgG
- RUBELLA – IgM
- TESTOSTERONE

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- TSH
- TORCHS TEST
- TOTAL SERUMβ-HCG
- TPSA
- TROPONIN I

- VIRAL LOAD(HIV/HBV)
- α – FETOPROTEIN

APPENDIX C (LABORATORY REJECTION FORMS)

CENTRAL LABORATORY SERVICE
KORLE BU TEACHING HOSPITAL
Laboratory Sample Rejection Form FKBTH-CL/CS/0709.1A

Dear Clinician,
Kindly note that the test request or primary sample(s) submitted for …… (examination) on ……(name of patient/client) is/are unsuitable for the test performance..

Cause(s) of unsuitability

□ Sample taken at wrong time
□ Sample in wrong tube/bottle
□ Unlabelled samples
□ Insufficient sample volume
□ Haemolysed sample
□ Clotted sample
□ Name on sample and request form do not correspond
□ Others pls specify: ……..……
……..……
……

□ You are required to come to the lab to positively identify a specimen.
Please provide a:
□ fresh and adequate sample and/ or
□ relevant information for the above request/assay.
Thank You.

……..……..

Lab. Reception Personnel
Tel_____

Client Service Officer
Tel_____

CENTRAL LABORATORY SERVICE
KORLE BU TEACHING HOSPITAL

Unlabelled or Mislabelled Sample Documentation Form
FKBTH-CL/CS/0709.1B

I, ……. (Name of

Clinician), of ……(Dept.) positively identify

…… …… (Sample type) as

belonging to ……(name of

patient/client) which I mislabelled and would want the laboratory to work on

the sample submitted.

……. Signature

……. Client Service Supervisor
Tel_____

Physician's Tel No……

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Annex 2: Factors that affect lab examination or interpretation of results.

Table 10: factors that affects laboratory performance and interpretation of results

	Possible causes	Effect
Haemolysis	Shaking	Marked variations in analytes (Hb, K^+, RBC…)
	Poor sample collection technique	
	Presence of water in specimen (blood)	
	Forcing blood through needle	
Prolonged tourniquet application time	difficulty in locating vein	Marked variation in analytes (RBC, Hb, Ca^{2+}…)
Clotted sample	Poor sample collection technique	Marked variation in analytes. Reduced platelets
	Use of wrong tube	
	Expired tubes	
Delay in sample transport	Forgetfulness/unavailable means of transport	Loss of organisms, marked variations in analytes
Diluted samples	Blood from an infused site	Marked variation in analytes (Hb, RBC, Na^+…)

NB: The table above is not exhaustive. Contact and/or notify the laboratory when such situations occur.

General Precaution for microbiology samples

Special precautions for microbiological samples

Specimen	Special collection instructions
Aspirates or swabs from abscesses, wound and fluid specimens	**General precautions:** The site, amount and method used to collect these specimens play a critical role in determining the usefulness of the culture results. For purposes of meaningful culture results, proper disinfection of the skin and collection of representative specimens is advised. Therefore, collection of a tissue biopsy, aspirates and aliquots of pus/fluid is superior to a swab. Sterile specimen jars or sterile Vacutainer tubes without additives should be used for collection of such specimens. Do not place biopsy specimen in formalin or wrap in gauze. Swabs of superficial wounds and ulcers: The surfaces are usually colonised and cultures from such specimens often yield mixed bacterial flora, which do not reflect the organisms of true infectious significance. Therefore, every effort should be made to obtain specimens from deeper aspects of these lesions with careful avoidance of the contaminated tissue surface. Submit the specimen in a sterile container and deliver to the laboratory without delay. Aspirates: Decontaminate the collection site with 70% alcohol and/or with 10% povidone iodine solution and allow to air-dry. Aspirate the deepest part of the lesion using a 3-5ml syringe and a 22-23 gauge needle. The aspirating syringe can be used as the transport container if the needle is removed and the syringe is capped. Alternatively, transfer the aspirate into a sterile container and transport to the laboratory

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	promptly.
Burn wounds	The surface of burn wounds is commonly colonied by the patient's own microbial flora or by environmental organisms therefore collection of a representative specimen is important. Swab cultures of burn wounds are not adequate for the detection of true and potential pathogens therefore biopsy specimens are recommended. The collected punch biopsy should be submitted in a sterile container.
Stool specimen	Obtain unformed stool specimens. Take parts of the stool that look bloody or slimy (contain mucous/pus). Fill each container at least 1/3 full. DO NOT overfill the sterile specimen jar. Replace the lid. Complete the request form. Please provide the suspected clinical diagnosis to enhance appropriate processing of the specimen in the laboratory. Do not submit more than one stool specimen for any individual patient within a 24-hour period. Stool specimens can be collected at any time of day and can be stored at room temperature for up to 2 hours. Where room temperature exceed 25°C then store in a refrigerator (2-8°C).
Urine sample	<u>Female precaution:</u> Wash hands well. Clean the urethral opening and vaginal vestibule with gauze/cotton wool soaked in water/saline. Hold the labia apart during voiding. The patient should pass a few milliliters of urine into the toilet bowl, DO NOT STOP THE FLOW, and then collect the midstream portion of urine into the sterile specimen container. <u>Male Collection</u> Wash hands well. Clean the penis, retract the foreskin (if uncircumcised) and wash with gauze/cotton wool soaked in water/saline. Circumcised men are not required to clean the peri-urethral area before voiding. Keep foreskin retracted while voiding. The patient should pass a few milliliters of urine into the toilet bowl, DO NOT STOP THE FLOW, and then collect the midstream portion of urine into the sterile specimen container.
Follow this procedure for urine specimen collection in children	It is advisable that you attach the bag before feeding the baby. Make sure the pubic and genital areas have been thoroughly washed, and are clean, dry and free from powder. Wash your hands and remove the strip of protective paper on the bag, exposing the adhesive. Do not place your fingers inside the bag as this will contaminate the sample. **Female Collection**: Position the wider part of the opening of the bag so that it covers the upper part of the genitalia, ensuring that the small end of the opening is applied firmly to the skin in the area between the vagina and rectum. Apply gentle pressure to the adhesive area to seal. **Male Collection**: The wider section of the opening is placed under the scrotum, the penis inserted into the bag and firm pressure applied to the adhesive area to seal. Check every 15 minutes to see if the baby has passed urine. ,It is not advisable to apply a tight nappy. Do not leave the paediatric bag on the baby for more than one hour.

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	Discontinue using, if skin develops symptoms of an allergy. When the specimen has been collected, remove the bag gently by tucking up. Then fold the two adhesive surfaces together and seal the bag. Hold the bag over a sterile urine container and using clean scissors, cut off a corner, let the urine run in the container, replace the lid and dispose of the plastic collection bag. Store in the refrigerator (2-8ºC). Please return container to the health facility promptly. Inform staff that sample was collected using a paediatric bag.

Test request form information

INFORMATION TO BE PROVIDED ON REQUEST FORMS The following information should be provided on the request forms:	
Patient information Patient full name, sex, age and date of birth, folder, and identification (ID) number **Why?** To ensure that the laboratory data is matched to the correct patient and that appropriate age and sex adjusted reference range(s) are supplied. **Facility information** Facility name, Facility code: Laboratory Information System facility location code if known Why? To ensure that the laboratory results are sent to the appropriate health facility. **Collection date and time** Date and time of collection **Why?** To ensure laboratory can determine viability of specimen for processing. **Healthcare worker information** Full name and ID **Why?** To ensure that the laboratory can contact the healthcare worker (HCW) if the need arises.	**Phlebotomist's information (where there is a phlebotomy service)** Name of the person collecting the specimens Why? Information is required if the person collecting the specimens is not the same as requesting healthcare worker. **Tests requested** Mark appropriate tests as indicated by clinical guidelines from the list of tests on the form. **Why?** To ensure each specimen is correctly processed only for tests requested. **Concise description of the clinical problem/diagnosis** **Why?** To assist in the extent of specimen processing and results interpretation. **Special Preparations of patient for sample collection** **Why? It helps to guide the appropriate laboratory methodology to be applied.**
The following information is mandatory for data capturing, processing and reporting of results on laboratory specimens:	
Facility name Patient's ID number Patient's full name Patient's date of birth	Patient's sex Healthcare worker's name and ID Healthcare worker's signature Collection date/Time

Critical values reporting

Critical values are laboratory test results which are considered life threatening and required urgent clinical attention. Critical results will be communicated by the laboratory, therefore it is essential that up-to-date contact details are available for the

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normal working hours. The laboratory requires phone details and other contacts information that are appropriate to receive critical results in a timely manner for all users.

The requesting clinician/requesting ward is called directly (if contact phone number is provided on test request form). The following details are communicated in reporting critical results:

- the results conveyed
- the patient's hospital number/LHIMS number.
- test performed,

The requesting clinician/requesting ward will be required to:

- Confirm the identity of the person receiving the critical report
- Verbally repeat the critical result communicated. This is toensure accuracy of communication. The conversation should be recorded in the laboratory for future reference.

Sample referral

Our laboratory where applicable refers samples to other laboratories to ensure continuity of service. A sample referral process involves a series of steps to transfer a sample from one service provider to another. It typically includes identifying the need for sample referral, completing necessary documentation, contacting the receiving facility or professional, and ensuring a smooth handover of information and sample of the patient.

A. Where samples are referred to a referral laboratory the client is informed about the change in agreement through a phone call or other approved means of communication.
B. Reports of a referred sample is reported in the name of the testing laboratory or otherwise agreed per the service agreement.
C. Where there are delays due to the sample referrals clients is informed.

REFERENCE RANGES

Medical laboratory reference ranges, also known as normal ranges, are the typical values expected for a particular lab test in a healthy population. They act as a guide for health provider to interpret a patient's test results and determine if they fall within a normal range or suggest a potential health issue. Tests are reported with applicable reference ranges. Where reference ranges are modified requesters will be notified. Please note that reference ranges may change with change in testing methodology. Reference ranges are reported with the patient test report where applicable.

RESULT COLLECTION GUIDE FOR CLIENTS

Medium of collection	Point of collection	Means of recipient identification
Paper copy	Laboratory reception	Hospital card Receipt of payment
Electronic copy	• Email • Transmitted via information	• Prior request • Prior request • Requester login

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	management system	

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