A

On Job Training Report

On

CLINICAL LABORATORY

Completed at

Sai laboratories peth Vadgaon
Address - Opposite S. T stnd,
Near Girija Hospital,
Peth Vadgaon, 416112.

By

Miss. Shurtika Manik Pardeshi

M. Sc. Microbiology

Part I Semester II

PG Department of Microbiology

Vivekanand College

(An Empowered Autonomous Institute)

Kolhapur, 416003

Maharashtra, India

2024-25

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

Dissemination of Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE, KOLHAPUR

(AN EMPOWERED AUTONOMOUS INSTITUTE)

(स्वायत्त) कोल्हापूर

PG Department of Microbiology

CERTIFICATE

OF

"ON JOB TRAINING"

This is to certify that Miss. Shurtika Manik Pardeshi (Exam seat No. 1119127)has satisfactorily

carried out the required practical work prescribed by the BoS Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for M.Sc. - Part- I Semester II course in On Job Training (Sub code – OJT20MIC21)

and this report represents her Bonafide work in the year 2024 - 2025

Place: Kolhapur

Date: 15-4-25

Examiner

OJT In charge

Head

HC HEAD
DEPARTMENT OF MICROBIOLOGY
VEKANAND COLLEGE,KOLHAPUR
(EMPOWERED AUTONOMOUS)

DECLARATION

I hereby declare that I have successfully completed the On Job Training program at Sai laboratories peth Vadgaon. I acknowledge that skills acquired during this training program are valuable to me and will contribute to my professional development.

I express my gratitude to supervisor Mr. Javed inamdar Sir (Owner of sai laboratories) , At. Sai laboratories peth Vadgaon and the whole training team for their support and guidance throughout the training.

Date: 15-04-25

Place: Kolhapur

Miss.Shrutika Manik Pardeshi

ACKNOWLEDGEMENT

At this juncture where the herculean task is nearing its pinnacle, science deems it a pleasure to look back and acknowledge efforts and support of all kith and kin that helped with zeal to turn a distant dream of an industrial training into reality.

We are extremely thankful to Dr. S. D. Mali, Assistant Professor, PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute), project guide for her valuable guidance and mentorship throughout this project work given to us during the study.

We are indeed grateful to Head Dr. T. C. Gaupale, Coordinator Ms. V. V. Misal, PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for their kind co-operation and valuable support and we are also thankful to all the staff members of our department for their direct and indirect support.

We are thankful to Principal Dr. R. R. Kumbhar, for his kind co-operation and valuable support.

Also, we sincerely thank our parents for helping us in all aspects to complete the project work. Finally, we would like to appreciate our friends, colleagues for their direct and indirect contribution.

Date: 15-04-25

Place: Kolhapur

Miss.Shrutika Manik Pardeshi

INTERNSHIP UNDERTAKING

1. Student Name	Miss. Shurtika Manik Pardeshi
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5. Mobile Nos.	9075284652
9. Internship /Area (Company/Institute)	Sai laboratories, Peth Vadgaon. Adress -Sai laboratories peth Vadgaon ,Opposite S. T stnd, Near Girija Hospital, Peth Vadgaon, 416112

I confirm that I agree with the terms, conditions, and requirements of the Internship Policy

Student

Signature: Date: 15-04-25

I confirm that the student has attended the internship orientation and has met all paperwork and process requirements to participate in the internship program, and has received approval from his/her mentor.

Sign of Head of the Department:

Date: 15-04-25

I/C HEAD
DEPARTMENT OF MICROBIOLOGY
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

SAI LABORATORIES

COMPUTERISED CLINICAL LABORATORY

CERTIFICATE

DATE : 31/12/2024

TO WHOMSOEVER IT MAY CONCERN

This is certify that Miss. Shrutika Manik Pardeshi is working with our esteemed Organization as a lab technician since 15/12/2024 to 31/12/2024 .

We found this candidate fully committed to this job and totally sincere Toworads this organization.

This certificate has been issued as per the request from MISS. Shrutika Manik Pardeshi .

THANK YOU .

Javed Inamdar
B.Sc., Adv. D.M.L.T. (M.S.B.T.E.)
P.M.C. Reg.No. AD/MLT/0017/2019

Dr. V. G. Powar
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Opp. S. T. Stand, Near GIRIJA HOSPITAL, Near Ichalkaranji Janata Bank, Peth Vadgaon
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Biochemistry & Haematology Investigation on Computerised Autoanalyser

INDEX

ABOUT LABORATORY

Sai Laboratory is situated in Pethvadgaon. As compare to other this laboratory in full of all equipment, and higher facilities. This laboratory provides all type of services at reasonable rate. The results of this laboratory Accurate Because it merges with metropolis the pathology specialist. All type of tests conducted in this laboratory. The stop of this Laboratory is punctual & highly qualified with great experience in their field, go this lab is very useful for the people.

This lab offers Various opportunities for students to think creatively, develop techniques & explore their interests. Therefore, Pathology lab is essential for students to learn & explain pathological facts & theories.

A medical laboratory or clinical laboratory is a laboratory where tests are conducted out on clinical specimens of patient to aid in diagnosis, treatment & prevention of disease.

INFRASTRUCTURE OF PATHOLOGICAL LAB

A) Pathology laboratory is equipped with state of art facilities like Incubator, centrifuge, Freeze, Analyzes, CBC machine calorimeter, electrolyte analyzer etc.

B) Various chemicals, indicators & papers are used in lab.

1) Ethanol
2) Sulphuric acid
3) Nitric acid
4) Hydrogen Perioxide
5) Sodium hydroxide
6) Buffer
7) pH paper
8) Starch
9) Iodide
10) Turmuric Paper
11) Litmus
12) Methyl orange
13) Phenopthalein etc. are the few common indicators used in laboratories.
14) Benedict's Reagent

Litmus: - It shows red colour in acidic solution and blue colour in basic solution.

Methyl orange: - It show red colour in acidic solution & Yellow colour in basic solution .

Phenolphthalein :- It is colourless in acidic solution and pink colour in basic solution.

INSTRUMENTS

1) INCUBATOR:-

Fig no.1: Incubator

Lab Incubators are essential equipment in the laboratory that provides a temperature controlled environment to support growth of microbial cultures.

A laboratory incubator is heated; insulated box used to grow and maintain microbiological of cell cultures. The incubator maintains optimal temperatures, humidity and gaseous content of the atmosphere inside.

Working of Incubator:-

An incubator is based on the principle that organism require a particular get of parameters for their growth and development with the optimal condition (under artificial conditions) of temperature, humidity, oxygen & con levels.

1) Cabinet:- The cabinet is the main body of the incubator consisting of the double walled cuboidal enclosure with capacity ranging from 20 to 800 L.

2) Door:-

A door is present in all incubators to close the insulated cabinet.

A Handle is present on the out side of the door to help with the maneuvering of the door .

3) Control Panel:-

Control panel also has a witch to control the thermostat of the device.

4) Thermostat: -

Thermostat is used to get the desired temperature of the incubator.

5) Perforated Shelves:-

The perforations on the shelves allow the movement of hot air throughout the inside of the incubator.

6) L-shaped thermometer:-

A thermometer is placed on the top part of the outer wall of the incubator.

7) HEP A Filter:-

Some advanced incubators are also provided with HEP A filters to lower the possible contamination created due to airflow.

8) Humidity & gas control: -

The con incubators are provided with a reservoir underneath the chamber that contains the water.

Uses ofIncubator:-

Some of the uses of incubators are-

1) Incubators also provide controlled condition for sample storage before they can be processed in the laboratories
2) Laboratory incubators provides a controlled, contaminant free environment for safe reliable work with cell & tissue cultures under artificial conditions.
3) Microbiological incubators are used for the growth & Storage bacterial culture colonies & the determination of biochemical oxygen demand
4) Laboratory incubators are essential for cell & tissue culture, biochem ical & hematological studies) pharmaceutical work, & food analysis.

2) Centrifuge :-

Fig no. 2:Centrifuge

Centrifugation play an important role in both biological sectors as well as industrial sectors.

Medical laboratories use centrifuges to seperate Plasma from heavier blood cells.

Modem centrifuges can even seperate mixtures of different sized molecules of microscopic particles such as parts of cells.

Uses:

The centrifuge used to seperate solids suspended in a liquid by sed imentation.

The rotational movements allow forces much greater than gravity to be generated in controlled periods of time.

In the laboratory, centrifuge, can used to seperate blood components: red cells, white cells, platelates to carry out further analysis tests & treatments.

There is a wide range of centrifuges capable of serving specific. Industry & research.

3) Freeze: -

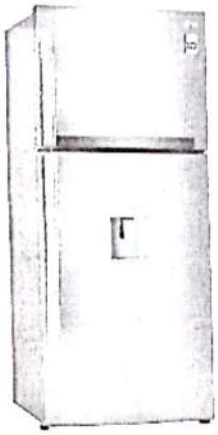


Fig no. 3: Freeze

Laboratory freezers are suitable for storing and maintaining the temperature of certain. materials like cool samples of specimens for Preservation.

They include refrigeration units for storing blood Plasma & other blood Products, as well as Vaccines & other medical or pharmaceutical supplies.

A Freezer is a crucial component of a laboratory as it is often necessary for the long-term storage of biological materials, like vaccines. bacteria samples; tissue samples & certain chemicals.

4) Analyzer: -

Fig no. 4:Analyzer

Analyzer are medical laboratory device used to calculate the concentration of certain substances. within samples of serum, plasma, urine and other body

fluids.
Substances analyzed through these instruments include certain metabolites, electrolytes, proteins and lor drugs

Benefits of anclyzer

It allows timely and accurate sample analysis and quality laboratory testing.

It speeds up the analysis of complex biochemical reactions.

It helps to streamline routine laboratory activities ..
It provides the best quality, reliable diagnostic information by providing test reports as soon as possible.

5) CBC Machine :-

Fig no. 5:CBC Machine

The CBC is usually performed by an automated hematology analyzer, which counts cells & collects information on their size and structure-
The concentration of hemoglobin in measured, and the red blood cells indices are calculated from measurements of red blood cells and hemoglobin.
CBC machine is an instrument designed to automate & and streamline the process of performing complete. Blood count tests.
CBC machine utilize advanced technology to analyze blood samples and provide accurate quantitative and qualitative measurements of various blood components,

6) Calorimeter :-

Fig no. 6:Calorimeter

A calorimeter is used to measure the thermal change of a body.

Calorimetry is applied extensively in the fields of thermochemistry In calculating the enthalpy, stability, heat capacity etc.

Calorimetry is used to measure amounts of beat transferred to or from a substance the heat is exchanged with a calibrated object (calorimeter)

The temperature change measured by the calorimeter is used to derive the amount of heat transferred by the process.

Microscopy:

The human vision has limitations and unable to see microscopic objects. Microscopy

deals with the enlargement of microscopic objects in order to make them visible to the naked or unaided eyes

The instrument used for enlargement of such In icroscopic objects is called as the microscope.

Light Microscope:

It uses natural or artificial light to illuminate the object and system of glass lens for magnification. light microscopes are extremely versatile instruments.

Principle:

As mentioned earlier, light microscopes visualize an image by using a glass lens, and magnification is determined by, the lens's ability to bend light and focus it on the specimen, which forms an image. When a ray of light passes through one medium into another, the ray bends at the interface causing refraction. The bending of light is determined by the refractive index, which is a measure of how great a substance slows the speed of light. The direction and magnitude of the bending of the light are determined by the refractive indexes of the two mediums that form the interface.

Body Parts:

Base: It is horseshoe or U shaped. It provides the firm and stable base

Pillar: It is a pair of a short pillar-like structure raised from the base of the microscope. The pillar provides the finn and movable attachment site for body of the microscope

Arm: It is a backbone of the microscope. It is a curved structure, like a letter 'C' The microscope is assembled on the ann. At the base, the arm is joined to pillars in such a "yay that it can incline

Stage and mechanical stage: The stage is plane, horizontal platform with the hole at the center (2 to 3 inches in diameter) The stage provides the space for mounting a slide. The opening at the center allows the passage of light rays to illuminate the object on the slide. The mechanical stage is the assembled on the

stage and works on rack and pinion gear system.

Applications of light microscopes:

- It is used to study bacteria, algae fungi, protozoa .etc

  It is used to carry microscopic analysis of clinical sample is pathological laboratories

- It is used to study tissue sections of plants and animal.
- It is used to trace evidences in forensic laboratories

TESTS

1) Hemoglobin Test: - Method of Hemoglobiru-

Hb can be measured by 4 different principle like colour, specific gravity iron concentration or oxygen combined capacity.

Sahilis Method

Hb is converted in to acid haematin by the addition of 0.1 N Hcl and resulting brown colour is compair with standard brown glass the intensity of brown colour is depend on Hb concentration in the blood.

Sahali's Hb meter consist of

1. Colour Compalter
2. Qraduated tube
3. Hb pipette (20~l)
4. 0.1 *N/Hcl*
5. Distilled water
6. Dropper

Procedure

1. Take 0.1 N Hcl in sahalis tube at lowest mark.
2. Draw blood of to 20~llnake in Hb pipette by dvoiding bubble, wip excess blood on side of pipette with bubble.
3. Transfer blood into tube, rich the pipette mix well by sheking tube allow to stand at list to minute.
4. Dilute solution with distilled water *(D/W)* by adding few drops at a time by mixing reaction mixture until colour matches with the glass plate in the compareter.
5. After matching the level of fluid is noted this is the percentage ofHb present in blood.

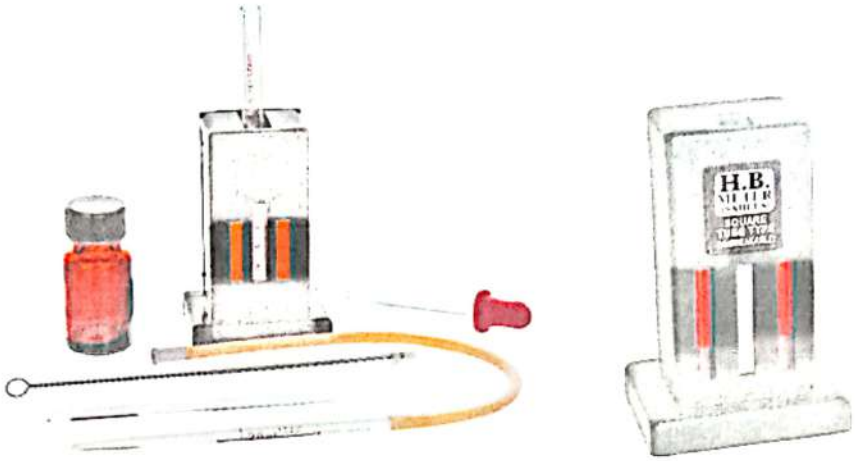


Fig no. 8:Sahli's Hemoglobinometer

2) CBC Test :-

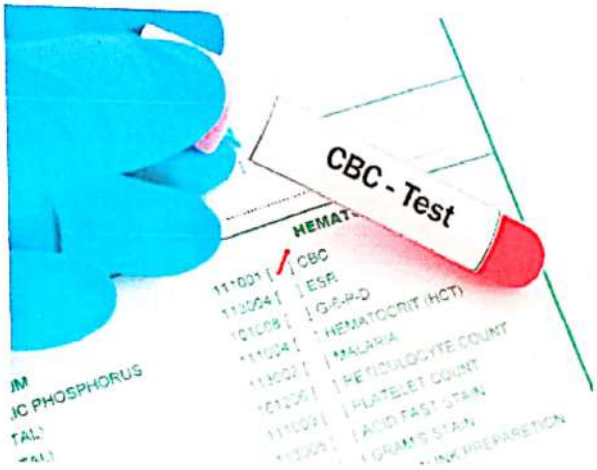
Aim:- A complete blood count (CBC) is a blood test. It's used to look at overall health and Find a wide range of conditions, including anemia, infection & leukemia. A complete blood count test measures the following: Red blood cells, which carry oxygen.

Usually there is no special prepration necessary for a complete blood count. The CBC is usually performed by an automated hematology analyzer, which counts cells and collects information on their size & structure. Lavender top tube: This tube is used to for Hematology CCBC, eg) and certain chemistry and Blood Bank testing. The tube contains EDT A (Ethylene Diamine Tetra acetic Acid) as an anticoagulant. samples collected in lavender tubes may not be used for coagulation tests

A complete blood count (CBC) test may take as much as 30 milliliters (ml) of blood. The different types of WBCs that have specific functions that care routinely reported. in a complete blood count are neutrophils, lymphocytes, basophils, eosinophils & monocytes.

Calculation of Blood count.

Hematocrit (Hct) iny. = (REC count in 111111ions x MeV) =10 : The Hct is the packed cell volume & is a calculated value & provides a measure of the amount of oxygen carrying capacity i11 relation to blood volume.



Also there are six ports ofCBC.

White blood cells (WBCs). These help your body fight germs

Red blood cells (RBe). These deliver oxygen throughout your body

Hemoglobin (Hb or Hgb). This is the protein in your blood that holds oxygen.

Hematocrit (Hct)

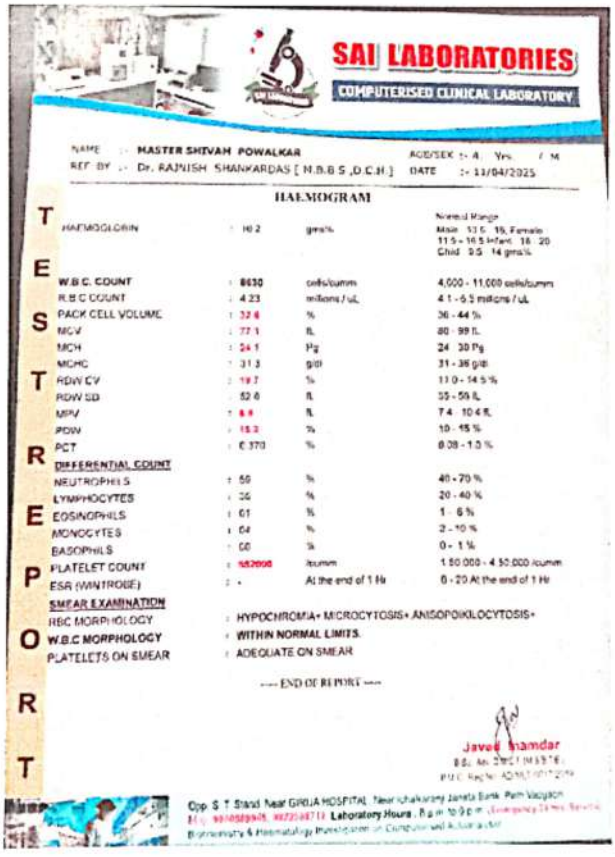
Mean corpuscular volume (MCV)

Platelets

Complete blood count table :-

Blood Component	**Abbreviation** used	**Reference range**
White blood cells	wgc	4500-11 ,000/mm3

Red blood cells	RBC	- Male - 4.3 - 5.9 million/mm ' Female - 3.5 - 5.5 million/mm '
Hemoglobin	HGB	Male-13.5-17.5g/dl Female-12.0-16.0g/dl
Hematocrit	HT	Male-41%-53% Female-36%-46%
Mean Corpucular Valume	MCV	80-100mm
Mean Corpucular Hemoglobin	MCH	25.4-34.6 pg/cell
Mean Corpucular Hemoglobin	MCHC	31%-36% Hb/cell
Platelets	Platelets	1,50,000-4,00,000 /mm



SAI LABORATORIES

COMPUTERISED CLINICAL LABORATORY

NAME :- MASTER SHIVAH POWALKAR AGE/SEX :- 4 Yrs. / M

REF BY :- Dr. RAJNISH SHANKARDAS [M.B.B.S ,D.C.H.] DATE :- 11/04/2025

HAEMOGRAM

TESTREPORT

			Normal Range
HAEMOGLOBIN	: 10.2	gms%	Male 13.5 - 18, Female 11.5 - 16.5 Infant 16 - 20 Child 9.5 - 14 gms%
W.B.C. COUNT	: 8630	cells/cumm	4,000 - 11,000 cells/cumm
R.B.C COUNT	: 4.23	millions / uL	4.1 - 6.5 millions / uL
PACK CELL VOLUME	: 32.6	%	36 - 44 %
MCV	: 77.1	fL	80 - 99 fL
MCH	: 24.1	Pg	24 - 30 Pg
MCHC	: 31.3	g/dl	31 - 36 g/dl
RDW CV	: 19.7	%	11.0 - 14.5 %
RDW SD	: 52.6	fL	35 - 56 fL
MPV	: 8.9	fL	7.4 - 10.4 fL
PDW	: 15.3	%	10 - 15 %
PCT	: 0.370	%	0.08 - 1.0 %
DIFFERENTIAL COUNT			
NEUTROPHILS	: 59	%	40 - 70 %
LYMPHOCYTES	: 36	%	20 - 40 %
EOSINOPHILS	: 01	%	1 - 6 %
MONOCYTES	: 04	%	2 - 10 %
BASOPHILS	: 00	%	0 - 1 %
PLATELET COUNT	: 582000	/cumm	1,50,000 - 4,50,000 /cumm
ESR (WINTROBE)	: -	At the end of 1 Hr	0 - 20 At the end of 1 Hr
SMEAR EXAMINATION			
RBC MORPHOLOGY	: HYPOCHROMIA+ MICROCYTOSIS+ ANISOPOIKILOCYTOSIS+		
W.B.C MORPHOLOGY	: WITHIN NORMAL LIMITS.		
PLATELETS ON SMEAR	: ADEQUATE ON SMEAR		

---- END OF REPORT ----

Javed Shamdar

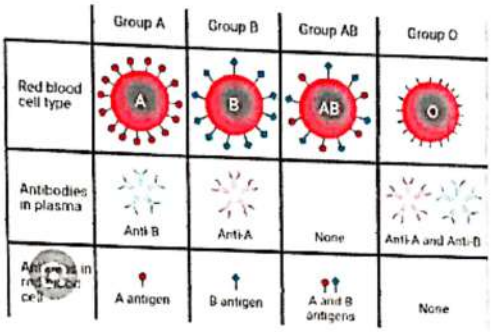
Opp. S. T. Stand, Near GIRIJA HOSPITAL, Near Ichalkaranji Janata Bank, Pen Vadgaon

Laboratory Hours : 8 a.m. to 9 p.m.

3) BLOOD GROUP:

The test to determine your blood group is called ABO typing. Your blood sample is mixed with antibodies against type A and B blood

In at-home blood typing tests, they typically ask that you prick your finger with a lancet and put drops of your blood on a special card. After putting the blood on the card, you can observe the areas where blood clumps or spreads out, and then match those reactions to an included guide .



Doctors call this the ABO Blood Group System.

Group A has the A antigen and B antibody.

Group B has the B antigen and the A antibody.

Group AB has A and B antigens but neither A nor B antibodies.

Group 0 doesn't have A or B antigens but has both A and B antibodies.

Rh-null or golden blood. It is the world's rarest blood type, with fewer than 50 known cases ever reported.

AB- AB- is the rarest of the eight basic blood types, accounting for less than one percent of the world's population.

HH blood type, rare ABO group, or Bombay blood group.

If your blood is A positive (A+), it means that your blood contains type-A antigens with the presence of a protein called the rhesus (Rh) factor. Antigens are markers on the surface of a blood cell. According to the American Red Cross, this is one of the most COITIITIOn blood types.

o positive is the most COmITIOn blood type as around 35% of our blood donors . have **it** The second most COITIITIOn blood type is A positive (300/0), while AB negative

(1 %) is the rarest.

Materials

- Toothpicks
- Blood sample
- Alcohol Swabs
- Lancet

Clean glass slide
Sterile cotton balls
Biohazard disposal container
Monoclonal Antibodies (Anti-A, B, and D)

Procedure

Take a clean glass slide and draw three circles on it.

Unpack the Monoclonal Antibodies (MAB) kit. In the first circle add Anti-A, to the second circle add Anti-B and to the third circle add Anti-D with the help of a dropper.

Keep the slide aside safely without disturbing.

Now wipe the ring finger with the alcohol swabs and rub gently near the fingertip,

where the blood sample will be collected .

Prick the ring fingertip with the lancet and wipe off the first drop of the blood.

As blood starts oozing out, allow it to fall on the three circles of the glass slide by gently pressing the fingertip.

Apply pressure on the site where it was pricked and to stop blood flow. Use the cotton ball ifrequired.

Mix the blood sample gently with the help of a toothpick and wait for a minute to

observe the result.

Conclusion

Here is the chart wh ich predicts the different types of blood groups along with its Rh factor.

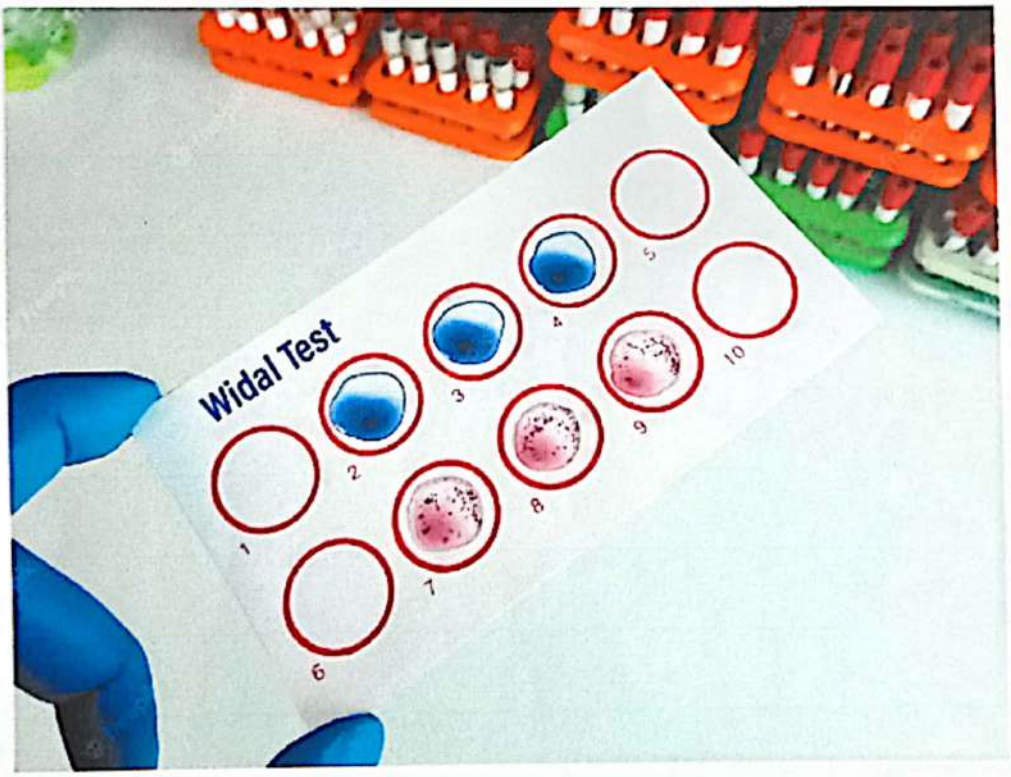
Blood Type	A	B	0	AB	
Rh-positive	A+	B+	0+	AB+	
Rh-negative	A-	B-	0-	AB-	

4) TYPHOID TEST:

A diagnosis of typhoid fever can usually be confirmed by analysing samples of blood, poo, or pee. These will be examined under a microscope for the Salmonella typhi bacteria that cause the condition.

A complete blood count (CBC) will show a high number of white blood cells. A blood culture during the first week of the fever can show S typhi bacteria. Other tests that can help diagnose this condition include: ELISA blood test to look for antibodies to the S typhi bacteria.

How do you read a Typhoid test? If IgG and IgM are present in the typhoid test, it indicates acute typhoid fever. If IgM only is present, it means you have acute typhoid fever. If there is only IgG and IgM is negative, it refers to a past Sahnonella infection. For a proper diagnosis, titres ranging from 1 :20, 1 :40, 1 :60, 1 :80, 1: 160, and 1 :200 need to be included in the diagnosis to obtain the typhoid test report. Negative Result - A negative, Only considered a normal range for a Widal test result is when the value of O and H antigens are less than 1: 160.



DENGUE TEST:

CBC test for dengue: Dengue fever is manifested by a decrease in White Blood Cells (WBC) < 5000 *cells/mm3* count (leukopenia), platelet count (thrombocytopenia)< *150,000 cells/mm3* and an increase in haematocrit value (5-100/0) with no evidence of plasma leakage.

A positive NS 1 test result confirms dengue virus infection without providing serotype information. A negative NSI test result does not rule out infection. People with negative NS 1 results should be tested for the presence of dengue IgM antibodies to determine possible recent dengue exposure.

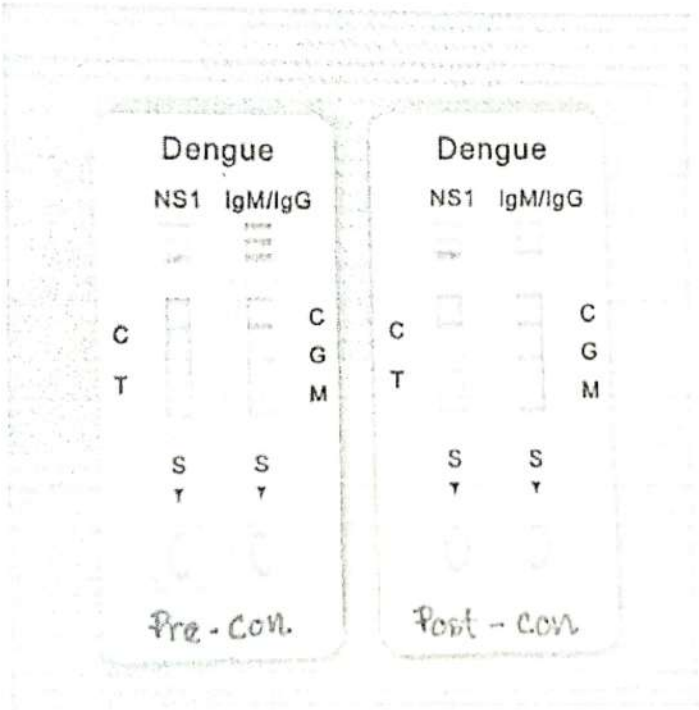


Fig no. 10: Dengue Test Kit

What is the normal range of a dengue test?

Sr. no.	Test	Normal Range
1	IgG & IgM	Less than 1.64 IV =negative. More than 2.85 IV =
		positive.
2	Hemoglobi	Men = 13.3 to 16.6 gm/dL Women = 11.6 to 15
	n	
3	WBC	4500 - 11000 /mltr
4	RBC	Men - 4.0 to 5.9 x *10*12/L* Women - 3.8 to 5.2 x
		10 12/L*

Fill the Dengue Antibody sample dropper upto lower circular part with 10 lll specimen *(seruml* plasma) and add the specimen to the sample well'S' of antibody device. Add 2 drops (70 lll) of sample (serum/ Plasma) using Dengue Antigen Test sample dropper to the sample well of antigen device. Read result at 20 minutes.

The most dangerous time of dengue fever occurs from day 3 to day 7 (from the time of onset first symptom of the disease). So how many days fever, dengue fever test? Patients can take a dengue test (dengue test) from the 3rd day since the first fever appeared, ie the fever has been 3 days.

When symptoms do occur, they may be mistaken for other illnesses - such as the flu - and usually begin four to 10 days after you are bitten by an infected mosquito. Dengue fever causes a high fever - 104 F (40 C) - and any of the following signs and symptoms: Headache. Muscle, bone or joint pain.

HbAlc TEST:

HbA 1 c is a blood test that is used to diagnose type 2 diabetes. It is also used to monitor blood glucose control in people with diabetes. HbA 1 c is short for glycated haemoglobin. The test is also sometimes called haemoglobin Al c. Haemoglobin (Hb) is the protein in red blood cells that carries oxygen through your body.

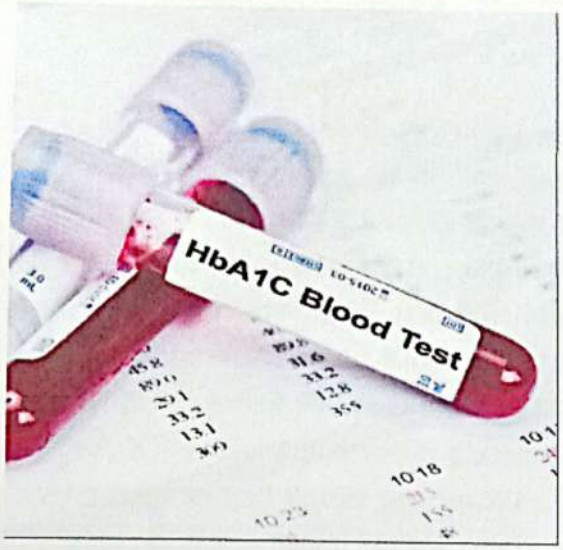
Four basic types of methods are used most commonly to measure HbAlc: immunoassay, ion-exchange high-performance liquid chromatography (HPLC), boronate affinity HPLC, and enzymatic assays.

A fasting period of at least 8 hours is required for the FPG test, whereas no preparation is needed for the HbA 1 c test. HbA 1 c measures your blood sugar levels over the past 2 to 3 months, while FPG measures your immediate blood glucose levels

For people without diabetes, the normal range for the hemoglobin Alc level is between 40/0 and 5.6%. Hemoglobin Alc levels in the range of 5.7%-6.4% mean you have prediabetes and a higher chance of getting diabetes. Levels of6.5% or higher mean you have diabetes.

Diagnosing Prediabetes or Diabetes

Normal	**Below 5.7%**
Pred iabetes	5.7% to 6.4%
Diabetes	6.5% or above



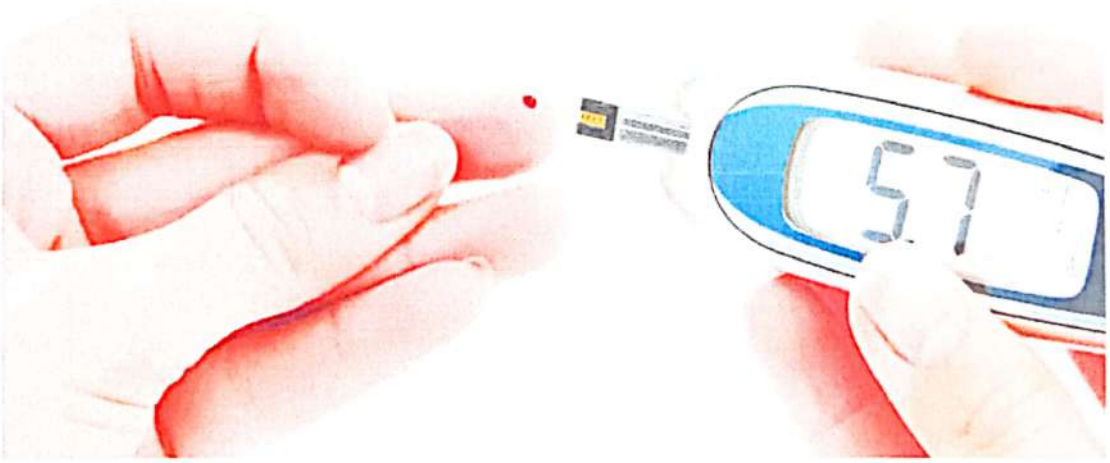
Blood Sugar (F, PP) blood test:

The Blood Sugar (F, PP) blood test is performed in two stages: F (fasting) and PP (post-prandial) (Post Prandial). The blood test F (fasting) provides important information about the body's ability to regulate blood sugar levels. The PP test is used to detect the quantity of glucose present in the blood after eating.

Glucose fasting (F) and Post Meal (PP) Test (Fasting and Post Prandial Blood Sugar Test) It is a simple blood test that is used to detect fasting blood sugar (FBS) levels and post prandial blood sugar (PPBS) levels. Here the sugar which is measured in blood is glucose. Test results vary by age and are usually measured in milligrams per deciliter (mg/dl.). Normal results for the 2-hour postprandial test based on age are: For those who don't have diabetes: less than 140 mg/dL. For those who have diabetes: less than 180 mg/dL.

Blood sugars by age

Sugar Test	Normal Range
Glucose Post Prandial (pp)	70-110 mg/dl
Glucose Fasting	100-125 mg/dl



Routine Urine Culture

Routine urine cultures can look for a urinary tract infection (UTI) and see which germs are causing it

For a urinalysis, your urine sample is evaluated in three ways: visual exam, dipstick test and microscopic exam

Urine drug tests are ITIOSt commonly used to detect alcohol, amphetamines, benzodiazepines, opiates/opioids, cocaine and marijuana

Urine test reveal

Diabetes or prediabetes.

Chronic kidney disease

Kidney or bladder stones.

Kidney or bladder cancer.

Bacterial or yeast infections.

A urinary tract disorder.

Sexually transmitted infections (STIs)

Liver or bile duct damage.

Urinalysis (General & Microscopic)

Urinalysis		
GENERAL **CHEMISTRIES**		
WBC	Male: 0-2/hpf	Female: 0-5/hpf
RBC	Male: 0-3/hpf	Female: 0-4/hpf
Casts	0-1 Hyaline/hpf	

Reference range

Color	Straw
Turbidity	Clear
pH	4.5-8
Specific Gravity	1 .001-] .030
Protein	Negative
Glucose	Negative

Ketone	Negative
Bile	Trace to 1 *mg/dl*
Urobilinogen Blood	Negative
Leukocyte	Negative
Esterase	Negative
Nitrite	Negative

Microscopic

WBC	Male *0-21* hpf
	Female *0-51* hpf
RBC	Male 0-3/hpf
	Female 0-4/hpf
Casts	**0-1** hyaline/hpf
Epithelial Squamous	Varies with collection
Epithelial Transitional	0-2
Bacteria clean catch	Occasional
Bacteria Catheterized	Not seen

These values are for theoretical reference and may vary from laboratory to laboratory and person to person.

Malaria Test

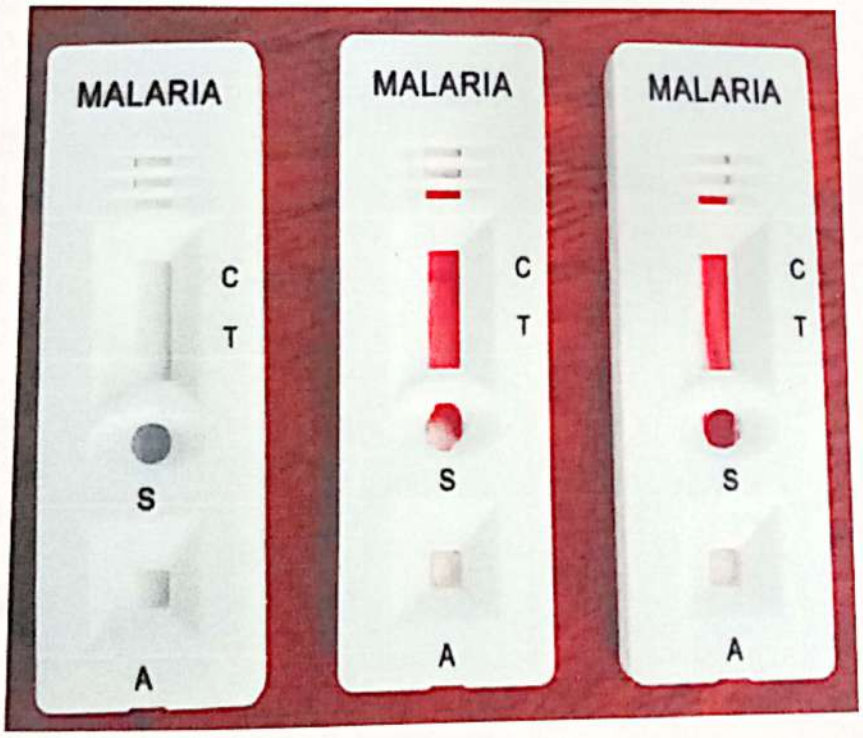
PCR is most useful for confirming the species of malarial parasite after the diagnosis has been established by either smear microscopy or RDTSerology detects antibodies against malaria parasites, using either indirect immunofluorescence (IF A) or enzyme-linked immunosorbent assay (ELISA).

PCR tests, or polymerase chain reaction tests, are also available to detect malaria parasites. These tests are more sensitive than routine blood smear microscopy tests or RDTs, but the results take longer, making them less ideal for initial diagnosis and treatment.

The diagnosis of malaria is confirmed by the identification of the malaria parasite in the patient's blood under microscopy. Laboratory tests may also reveal anemia with decreased hemoglobin, hematocrit, and haptoglobin in addition to either a decreased or increased leukocyte count.

A complete blood count test and electrolyte levels can identify some of the consequences of malaria, such as inflammation, anemia, and kidney failure.

An increase in fibrinogen levels in severe malaria,13 and an increase In fibrinogen tends to increase the rate of ESR.



Results

1. A line near letter '~C" and a line near leter "T" means the patient is positive for malaria.
2. 14.How to read the test results:
3. POSITIVE.
4. A line near letter "C" and nO llnE near letter "T" means the patient dOES nOT have malaria.
5. nEGATIVE ....
6. nO llnE near letter "C" and one or no line near letter "T" means the test is iNvALiD.

HIV Test

Principle: -

It utilizes the principle of agglutination of antibodies *1* antisera with respective antigen in immune chromatography format along with use of nano gold particles as agglutination revealing agent. Highly purified antigens gp41, gp 120 and p24 O fusion polypeptide, representing HIV 1 and HIV - 1 group O and synthetic peptide gp36 representing HIV 2 are striped on the membrane as two separate test bands. An Assay control forms the third band. Similar antigens are also coated on colloidal gold. A unique combination of synthetic peptides and recombinant antigens reduces cross reactivity and enable better discrimination between HIV 1 and HIV 2 samples.

As the test specimen flows through the membrane test assembly, the highly specific HIV *-112* antigens colloidal gold conjugate complexes with the HIV *-1/2* specific antibodies in the specimen and travels on the membrane due to capillary action along with the rabbit globulin colloidal gold conjugate.

This complex moves further on the membrane to the test region where it is immobilized by HIV -1 *12* antigens coated on the membrane at two separate test regions
for HIV-1 & HIV 2.

This leads to the formation of colored band(s). The presence of colored band(s) in the test in the test regions indicates the presence of antibodies to HIV -1 *1* 2 in the specimen. The unreacted conjugate and unbound complex, if any, along with rabbit globulin gold conjugate move further on the membrane and are subsequently immobilized by the Agglutinating sera for rabbit globulin coated on the membrane at the control region (C) , forming a colored band. This control band acts as procedural control and serves to validate the results.

Requirement: - 1) Bioline One Step Rapid Test Device HIV - 1 *1* 2 antibody

Procedure:- 1) Bring the sealed aluminium foil pouch of bioline diagnostics membrane test assembly to room temperature.

2) Open a foil pouch by tearing along the notch.

3) Remove the membrane test assembly and the sample applicator. Once opened, the membrane test assembly must be used immediately.

4) Label the membrane test assembly with specimen identify.

5) Place the membrane test assembly on a flat horizontal surface.

6) Carefully dispense one drop (25 ul) of serum/plasma into the specimen well 'S' using the sample applicator provided.

7) Add 3 drops of sample running buffer into the same well'S'.

8) observe the development of visible colored band at test regions (' 1 ' for HIVand/or '2' for HIV-2)

9) Positive results may be observed within 20 minutes.

10) The test should be considered invalid if the control band C does not appear.

The test is also invalid if neither the control nor the test bands appear. Repeat the test with a new Bioline diagnostic membrane test assembly.

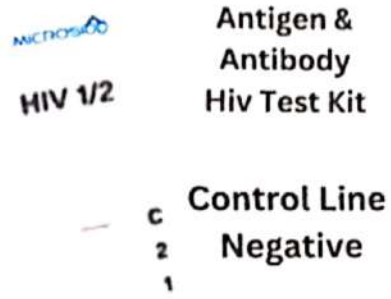


Fig no.11: HIV.Test

Interpretation of results:-

Negative: - A colored band appears only in the control area marked C

HIV -1 Positive: - A colored band appears in the control area as well as in the area marked 1. The sarnple is reactive for HIV -1.

HIV -2 Positive: - A colored band appears in the control area as well as in the area marked 2. The sample is reactive for HIV -2.

HIV-I& HIV-2 Dual positive: - A colored band appears in the control area as well as in the areas marked 1 & 2. This indicates a mixed infection.

Invalid: - The test should be considered invalid if the control band C does not appear. The test is also invalid if only the test band and no control band appear.

Repeat the test with a new Bioline diagnostic membrane test assembly.

Semen Analysis

Semen analysis, also known as a sperm count test, analyzes the health and viability of a man's sperm. Semen is the fluid containing sperm (plus other sugar and protein substances) that's released during ejaculation. A semen analysis measures three major factors of sperm health

Physical examination:-

Colour and appearance:- Greyish-white, viscid, opaque (normal finding) Clinical significance :- Increased turbidity may associate with inflammatory processes in some parts of the reproductive tract.

Viscosity:- The specimen of normal viscosity can be poured drop by drop. Increased viscosity is concerned with the poor invasion of the cervical ITIUCUS in post-coital studies. Absence of viscosity points to reduced cell content.

Volume:- 2-5 ml (normal finding)

A lesser amount may arouse suspicion of deficiency and premature weakening by vaginal acidity.

Liquefaction time:- 20-30 minutes (normal finding)

Failure to liquefy within 30 minutes may associate with infertility. The semen frOITI males with bilateral congenital absence of the vas deferens and seminal vesicles fails to coagulate due to the absence of coagulation substrate.

Chemical examination:pH:- 7.2-7.8 (normal finding)

Clinical significance:- pH values less than 7.0 are frequently associated with semen consisting largely of prostate secretions due to congenital aplasia of the vas deferens and seminal vesicles.

Fructose:- 150-300 mg/dl (normal finding) .Disorders of seminal vesicles may lead to reduction in fructose concentration. There is an inverse relationship between fructose level and sperm count. High fructose values associated with low sperm count.

Microscopic examinations:-

Sperm count: 40-300 millions/ml (normal value)

Motility after 2 hours, 3 hours, and 6 hours: 60-950/0 (normal finding)

Motile forms decrease by about 5% per hour after the fourth hour following collection.
Motility less than 60% may be associated with infertility.
Abnormal forms: 0-20%
More than 20% of abnormal forms may be associated with infertility. Following abnormalities in spermatozoa are observed.
Heads:- too small, too large, double heads, pointed heads, ragged heads
Middle piece:- absent, bifurcated, or swollen.
Tails: double, curved, rudimentary, or absent
pus cells: 1-21 HPF (normal finding)

Increased number of pus cells-Inflammation due to infection in some parts of the reproductive system. Infection of the seminal vesicle.

Epithelial cells:- 1-2/HPF (normal finding)
Increased nUlnber:- not significant
Red blood cells:- Absent (normal finding)

LABORATORY SAFETY AND WASTE MANGEMENT

LABORATORY HAZARDS AND ACCIDENTS

The main hazard and accidents associated with medical laboratory work are as follows:

Harmful effects of toxic chemicals

Injury from explosions

Electric shock

Burns,cuts

Infection :-

Infection can be caused by:

Pathogens being inhaled in aerosols (airborne droplets) when snap closing specimen contain, dispensing or pipetting infectious fluids, or centrifuging infectious material in open buckets. Aerosols may also be formed and inhaled following breakages or after spilling infectious fluids. Breakages in centrifuges can be particularly hazardous if the centrifuge is opened before the aerosols have settled .

Pathogens being ingested from contaminated fingers, or in food that has been contaminated, eg by being stored in a laboratory refrigerator. Care should be taken to avoid the fingers or other parts of the body touching infected material.

Mouth-pipetting specimens and cultures is one of the COmITIOnest ways of ingesting pathogens. Pathogens entering the skin through needle punctures, cuts, scratches, insect bites, sores or other open skin lesions. Laboratory workers must always handle infected needles with great care.

Note: Laboratory-acquired infections are more fully dis cussed in Chapter 33 in Volume II of the Manual.

Burns:-

Burns may be caused by: Flammable chemicals and stains, or by rea- gents catching alight Fires from spirit lamps, Bunsen burners, Need tapers (eg. when heating Ziehl ment or save), or from faulty electrical equip overloaded Spirit burners should not be used in direct sunlight because in bright light the flame can be difficult to see. Corrosive chemicals being spilt on the skin or ingested when mouth-pipetting.

Cuts

Cuts may be caused by: Breakages, Using glassware that is cracked or has damedges Walking on glass chippings. Harmful effects of toxic chemicals.

Harmful effects of toxic chemicals

Harmful effects of toxic chemicals can be caused by:

Inhaling fumes from toxic chemicals, Ingesting toxic chemicals by 1110uth pipetting, Skin contact with toxic chemicals.

Injury from explosions

Injury from explosions can be caused by: Incompatible chemicals exploding, Leaking gas exploding.

Electric shock

Electric shock can be caused by: Faulty electrical circuits, Incorrect installation of equipment, Touching exposed live wires.

Factors contributing to laboratory accidents

While a poorly designed laboratory and over crowding can increase the risk of accidents occur ring, most laboratory accidents are the result of bad laboratory practices due to:

poor training.
lack of concentration,
noisy environment,
untidy working and not using racks to hold containers,
allowing the working bench to become cluttered,
carelessness and neglect,
overwork and fatigue,
hot and humid climatic conditions.

Every laboratory no matter how small should establish an appropriate Code of Safe Laboratory Practice. The head of the laboratory or a person designated as Safety Officer should ensure that this Code is followed.eg. Technical Staff ,Laboratory Aids, Out Patients,Cleaners And Other Visitors.


Hand washing steps
Wet your hands with clean, running water.
Apply soap and rub your hands together for at least 20 seconds.
Rinse your hands until all the soap is gone.
Turn off the faucet with a paper towel or your elbow.
Dry your hands with a clean paper towel or hand towel.
Cleveland Clinic


Laboratory Safety

Learning outcome of training

Here, I have reached the conclusion of this report on the topic " CLINICAL LABORATORY would like to share my experience while working on this report. I learned many new things about health, and it was a wonderful learning experience for me.

This report has enhanced my thinking skills and deepened my interest in this .subject.I have learned a lot about problem-solving and how to tackle challenges effec.tively.I have gained an understanding of the role of microbiology in testing blood and urine samples. I also learned about the importance of effective communication and cooperation skills required in the laboratory setting.

Additionally, I have learned about various tests related to the human body and urine, such as Blood Grouping HB, Dengue, Sugar, CBC, HIV, and semen analysis. I have also understood the procedures and protocols used in performing tests in the clinical laboratory.

Most importantly, I have acquired knowledge about collecting blood samples from patients using the vein puncture method. Thank you for entrusting me with this report. I thoroughly enjoyed the process of completing it.