A training report

Submitted to

Atmiya University

In partial fulfillment of the requirements for the degree of

Bachelor of Science in Biotechnology

By

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(2022-2023)

Under the supervision of

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DECLARATION

We hereby declare that the work incorporated in the present training report entitled " Routine blood analysis using various instruments in pathology laboratory" is our own work and it's original.This work has not been submitted to any other College\University for any Degree.

Date : 4th April , 2023

Place : Rajkot Student's signature

Classic
Pathology Laboratory

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TEST REPORT

INTERNSHIP CERTIFICATE

Dt – 05/02/2023

This is to certify that **Aarti V. Ajani.** has worked as a Laboratory technical trainee at Classic Pathology Laboratory from **15 December, 2022 to 31st January, 2023.**

She was an excellent addition to our team due to her perfection in working with automated laboratory equipments and samples. She is extremely professional with a firm grip on her field of work.

We wish her every success in her life.

Thanking You....

Yours sincerely,

Dr. Ishita Vaishnani
(MBBS , M.D. Pathology)
Classic pathology laboratory

CLASSIC PATHOLOGY LABORATORY * RAJKOT *

The test results are subject to...

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Thanking You....

Yours sincerely,

Dr. Ishita Vaishnani
(MBBS , M.D. Pathology)
Classic pathology laboratory

ACKNOWLEDGMENTS

We take this opportunity to thank everyone, who made our training possible. All the people that we have worked with have contributed to our learning process during all these months. We are thankful to all the people who have spared their valuable time for our training and help us to develop our insight for all the techniques.

Our special thanks to Dr. Ishita Vaishnani - Our guider under whose supervision, guidance and advice We have completed our training in a successful way.

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1	Blood collection
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Classic pathology laboratory

Biochemisrty

Urine analysis

Immunology

Hematology

Blood collection

Required equipments

- Blood sample tube
- Gloves
- Disposable syringe
- Tourniquet
- Alcohol swab

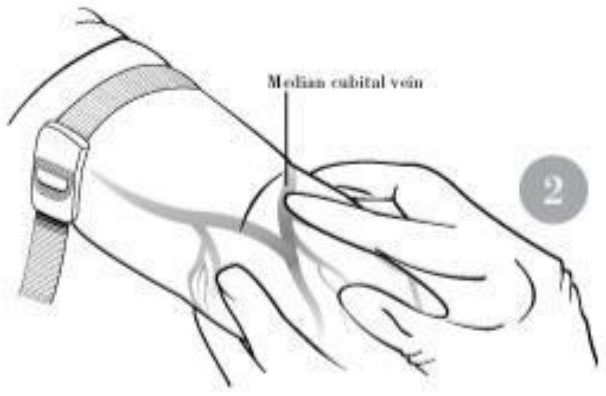
Method

- Wear your gloves
- Straiten the hand of patient
- Ask the patient to make fist
- Apply the tourniquet 2-3 inch above from the site of blood collection
- Feel the vein by pressing the area
- Clean the area in circular manner using alcohol swab
- Unpack the syringe and check if it is working or not
- Insert the needle 15-20 degree from the skin
- Blood in the hub indicates that needle has entered in the vein
- Withdraw the blood slowly
- Release the tourniquet after collecting sufficient amount of blood
- Ask the patient to open fist
- Apply cotton and withdraw the needle
- Transfer the blood into sample tube

How to Draw Blood

1

Tighten the tourniquet above the elbow on the patient's pronated forearm.



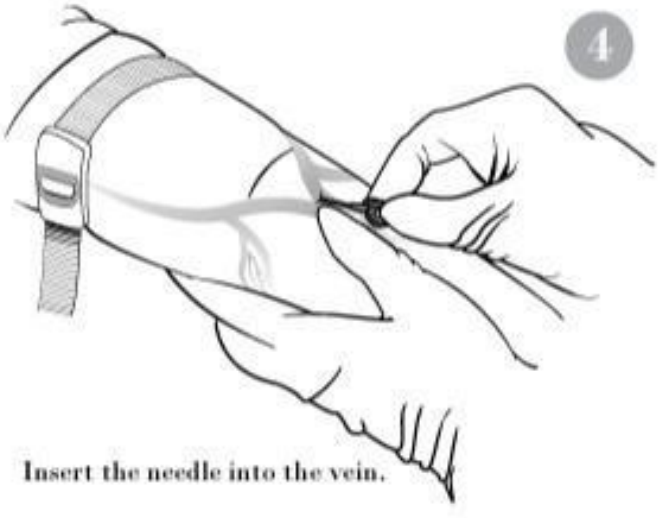
2

Palpate the cubital fossa for the median cubital vein.

3

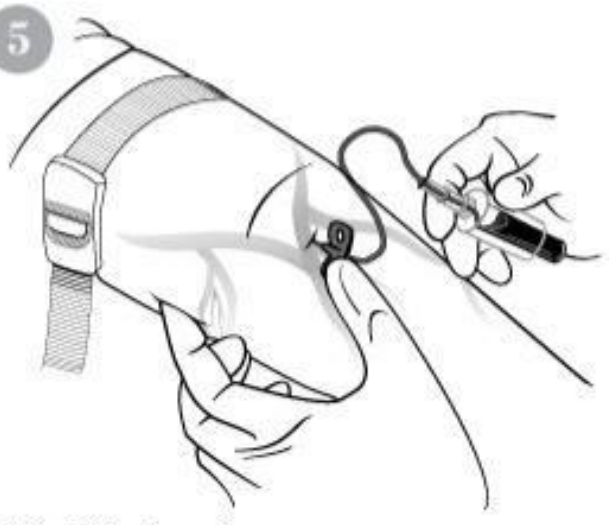
Sterilize the area of withdrawal.

4



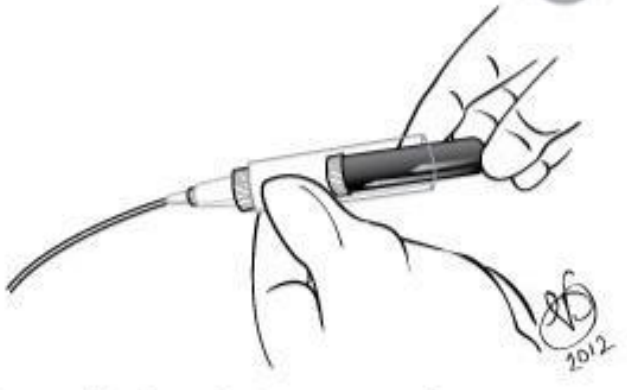
Insert the needle into the vein.

5



Collect blood sample.

6



Remove blood sample from casing and store.

Blood collection tubes

1. Purple top tube

It contains EDTA

Tube used for :

- CBC
- ESR
- Reticulocytes
- PTH
- HbA1C

2. Blue top tube

It contains sodium citrate

Test used for :

- Coagulation screen
  - B.T (Bleeding time)
  - P.T (Prothrombin time)
  - APTT

3. Gray top tube

It contains sodium fluoride and potassium oxalate

Tube used for :

- Glucose FBS
- GTT
- Lactate

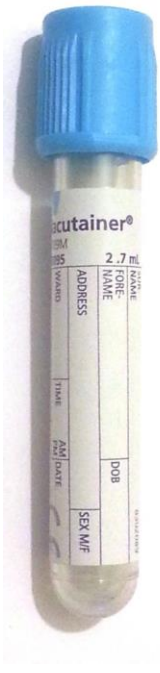
4. Red top tube

No addictive

Tube used for:

- Chemistry
- Immunology
- Serology


EDTA Tube
K3EDTA
Name:
Pat No:
3ml


acutainer®
2.7 ml
ADDRESS
SEX M/F
DOB


acuum Tube
Fluoride
2ml


No Additi
IVD
STERILE R

Complete blood count (CBC)

Components of CBC
- Haemoglobin
- RBC count
- MCV
- MCH
- MCHC

Components of WBC
- Neutrophils
- Eosinophils
- Basophils
- Monocytes
- Lymphocytes

Haemoglobin
- Females : 12-14
- In pregnancy 11 cut-off
- Male : 13-15
- Children : value varies as per age

WBC
Normal range : 4000-11,000
Leukopenia : decrease in WBC count
Leucocytosis : increase in WBC count

Platelets
Normal range : 1,50,000-4,50,000

Under these conditions doctor will suggest you a CBC test
- Fatigue , Weakness, Shortness of breath , Fever , Dengue , Malaria

Malaria Rapid Diagnostic Test

Requirements

- Marker pen
- An unopened rapid diagnostic test
- An alcohol swab
- Pipette
- Lancet
- Buffer for RDT
- Cotton wool

Note

- Make sure test has patient's information written on the test before one start the test including patient's name , the date that the test was done.
- Check the temperature range on the diagnostic box
- Also check Expiry date on the box

Procedure

- Clean the finger using alcohol swab (use non-dominant hand)
- Prick the finger (do it one smooth moment)
- Collect enough blood using pipette
- Put the drop of blood onto the blood window of the RDT
- Add 2 drops of buffer into the buffer window using gentle pressure
- Let the buffer run over the blood
- Relieve the test for 20 minutes

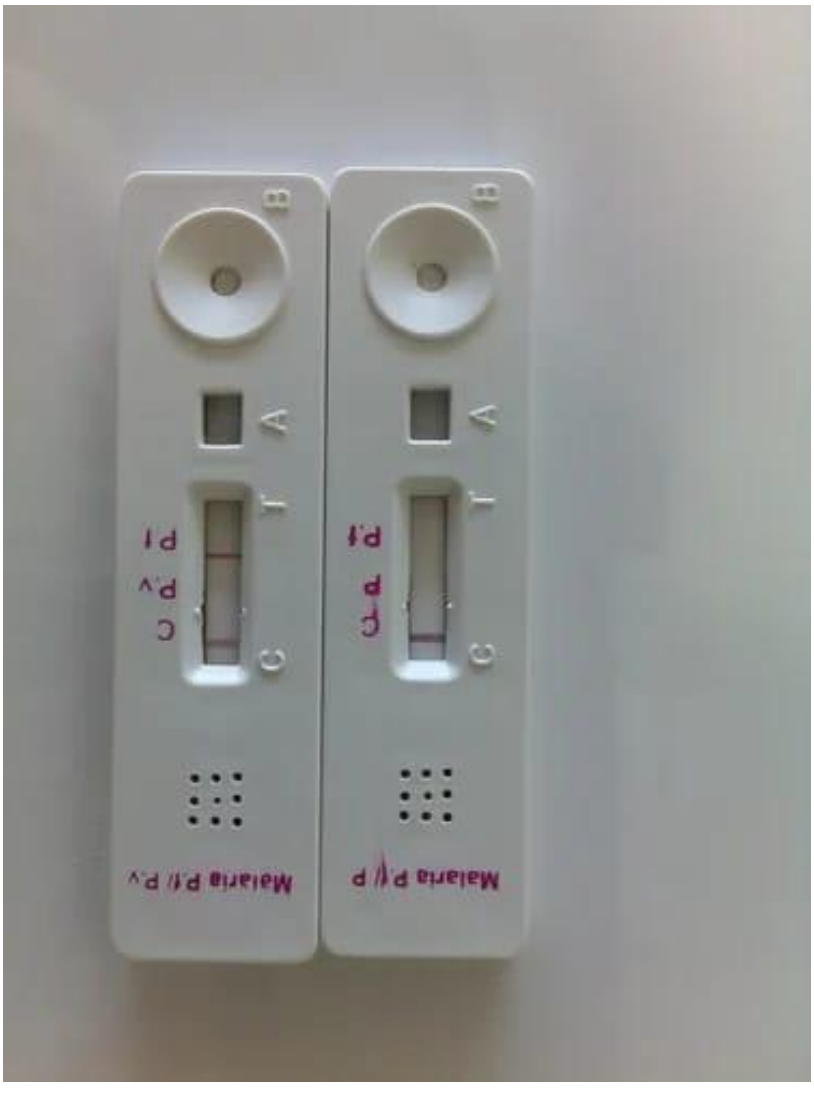
Interpretation of the test

Tests often show positive results within 3-5 minutes,
BUT a weak positive result can take much longer therefore calling the test results too soon (before 20 minutes) can give false negatives.

Positive result
Control line : visible clearly
Test line : visible clearly/ very faint

Negative result
Control line : visible
Test line : not visible

Invalid test
Control line : not visible
Test line : not visible / visible



HIV TRI-DOT Test

HIV TRI-DOT test is sesitive,rapid and accurate immunoassay for the differential detection of HIV 1 & HIV 2 antibodies(IgG) in human serum/plasma using HIV 1 & HIV 2 antigens immobilized on an immuno filtration mambrane.

It detects - AIDS

Reagents:

- HIV TRI-DOT TEST device or kit
- Buffer solution
- Protein A conjugate

Procedure:

- Add 3 drops of buffer solution to the centre of the device
- Hold the dropper vertically and add 1 drop / 50ul patient's serum sample by using sample dropper
- Add 5 drops of buffer solution
- Add 2 drops of protein A conjugate
- Add 5 drops of buffer solution
- Read the result
- Discard the device immediately

Interpretaion of the test:

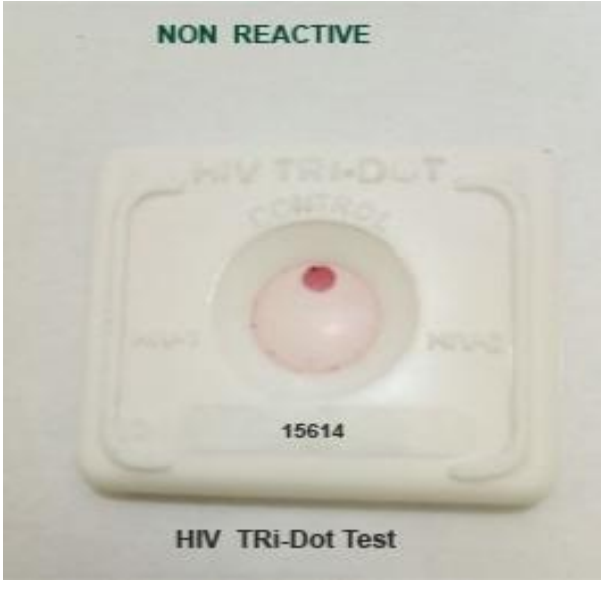
Invalid test
No Dot observed on control region
(Repeat the test)

Non-reactive
Visible Dot on control region
Kit is valid

Reactive for HIV 1
Visible Dot on control & HIV 1 region

Reactive for HIV 2
Visible Dot on control & HIV 2 region

Reactive for HIV 1 & HIV 2
Visible Dot on control, HIV 1 region & HIV 2 region



HIV Rapid test kit

It is a screening test for HIV virus.
Antibodies are produced in response to the presence of the human immunodeficiency virus (HIV) in the body. These antibodies are used for the detection of HIV virus .

Kit components:

- Instruction booklet
- Test cassette in sealed aluminium pouch
- Gloves
- Alcohol swab
- Bandage
- Disposable capillary pipette
- Buffer
- Lancet

How to test:

- Wear gloves
- Clean finger with alcohol swab
- Collect the blood (approximately 20 ul) using lancet and the capillary pipette
- Add blood to the specimen well(S) on the test device
- Add 2 drops of buffer(approximately 60 ul)
- Read result within 15-20 minutes

(Do not interpret result after 20 minutes)

Interpretation of the test

Positive result:
HIV 1 positive - red colour band at position C & 1
HIV 2 positive - red colour band at positon C & 2

Negative result:
One red colour band at position C

In babies with HIV positive mothers , the antibodies will test positive ,even though the baby is not infected - this is a false positive result.

APTT Blood Test
(Activated Partial Thromboplastine time)

Purpose:

Used to detect deficiencies intrinsic coagulation factors (prothrombin v ,viii ,ix ,x , xi ,xii & fibrinogen) and to monitor heparin therapy

Intrinsic - Depends on factors from within the blood vessels eg: kallikein

- More steps "longer cascade"
- Efficient
- Starts with factor XII
- Involves factor VII,IX,XI & XII
- Occurs in vivo & in vitro
- Normal value < 44 sec

Prolonged in :

- Heparin
- Haemophilia
- Liver disease
- DIC

Procedure:

- Set temperature at 37 degree Celsius on machine
- Select option “APTT”
- Add patient’s ID & press enter
- Add dry cuvette as shown on machine
- Add 50ul Activated Cephaloplastin reagent for APTT determination
- Add 50ul sample from the citrate vial using pipette
- Incubation starts for 180 sec automatically
- Add 50ul Calcium Chloride reagent for PT after completion of incubation
- Observe the result & note down the time

PT Test
(Prothombin tme)

- Extrinsic - Depends on factors from outside the blood
- Less steps " short cascade"
- Faster & less efficient than APTT
- Starts with factor VII
- Involves factor VII
- Occurs in vivo only
- Normal value < 14 sec

Prolonged in:

- Vit K deficiency
- Vit K antagonist
- Liver disease
- Factor deficiency (Extrinsic & common)
- DIC

Procedure:

- Set temperature at 37 degree Celsius on machine
- Select option "PT"
- Add patient's ID & press enter
- Add dry cuvette as shown on machine
- Add 50ul sample from the citrate vial using pipette
- Incubation starts for 120 sec automatically
- Add 100ul reagent for PT after completion of incubation
- Observe the result & note down the time

Conclusion –

Overall, Our experience as a trainee in laboratory was quite positive. During our training period we both like the blood collection methods the most in which we got chance to visit the ICU patient for blood collection. We understood the hard work & patience which requires to achieve the skills. Furthermore we also performed various urine & blood analysis tests because of this we are able to read some routine analysis report of patients.

In future, We would definitely look for another opportunities like this.