R. J. COLLEGE of Arts, Science & Commerce (AUTONOMOUS)

(Hindi Vidya Prachar Samiti's RAMNIRANJAN JHUNJHUNWALA COLLEGE of Arts, Science & Commerce)
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Affiliated to UNIVERSITY OF MUMBAI II NAAC Re-Accredited 'A' Grade (CGPA: 3.50)

Department of Biotechnology

On Job Training Completion Report

This is to certify that Sonali D. Gupta has completed On Job Training at

Kaizen Diagnostics Center

Date of Commencement	Date of Completion	Total Number of Days	Total Number of Hours completed in OJT
25/12/2023	25/01/2024	25	125

Name of the Guide/ PI/ Incharge : Sangita Bhardwaj

Phone Number of Guide/ PI/ Incharge : 9702993460

Email Address of the Guide/ PI/ Incharge : kdc.kaizen@gmail.com

Gupta
22-03-24

Sangita

Signature of Guide/ PI/ Incharge

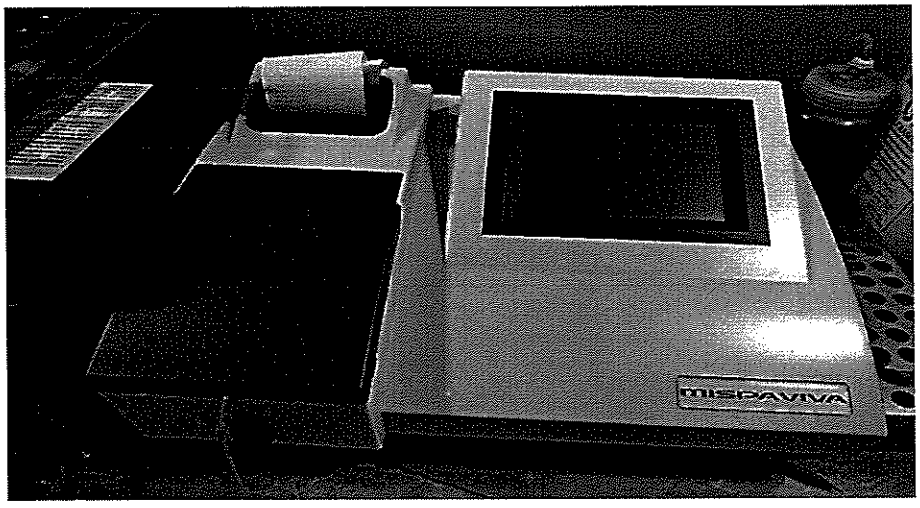
Stamp

ON Job Training Report (423 Sonali Gupta)

My name is Sonali Dashrath Gupta and I am a student of msc part 1. I completed my internship from 25/12/2023 to 25/01/2024 at Kaizen Diagnostic Center(Budhaji Nagar, Kalwa west, Thane, Maharashtra 400605). This report details my experience and the valuable knowledge I gained during this internship.On the very first day they showed me the automated machines and explained their process.During my internship, I participated in a variety of activities that allowed me to gain valuable insights into the field of pathology. Here are some key highlights:

- I worked on various tests in the lab.(creatinine,Amylase,lipase,Uric acid,calcium ,CRP, Cholesterol, Prothrombin time, electrolytes) and also I learned sample collection techniques.
- I had the opportunity to observe ECG, Sonography and X Ray. Through these activities, I developed new skills such as One of the challenges I faced during The key learnings I gained from this internship go beyond technical skills.
- While maintaining patient confidentiality, I assisted with data entry of basic patient information and preliminary test results.

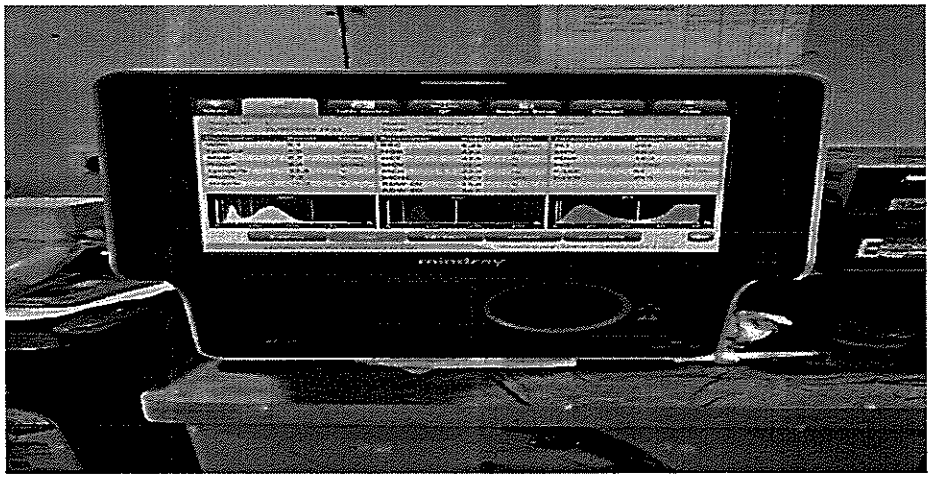
The primary Objective of my internship was to gain hands-on experience in various aspects of pathology laboratory work. And understand the role of pathology in healthcare diagnostics and patient care. This internship provided an opportunity to apply theoretical knowledge to practical scenarios, develop technical skills, and gain insights into the functioning of a pathology lab. The things I learned during the onset of my internship included sample collection techniques for CBC testing and all biochemistry testing.



Agappe Mispa Viva Biochemistry Analyzer

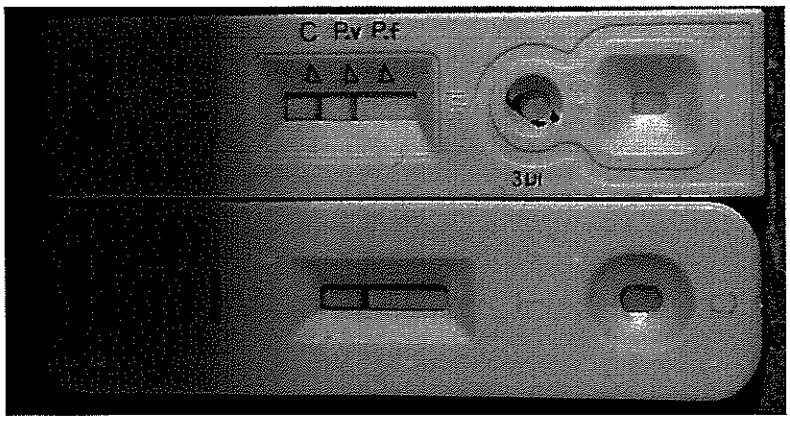
I have learned how to operate a semi automated Biochemistry analyzer instrument which gives numbers of the tests Glucose, LFT, RFT, Bilirubin ,HDL,CRP, Amylase, cholesterol ,TGs, lipase, CPKMB/CPK total. I also learn urine analysis. One strip is used which is dipped in urine and processed in the Machine. The urine dipstick is usually a thin, plastic stick with strips of chemicals on it. the chemical strips on it will change colour accordingly to:

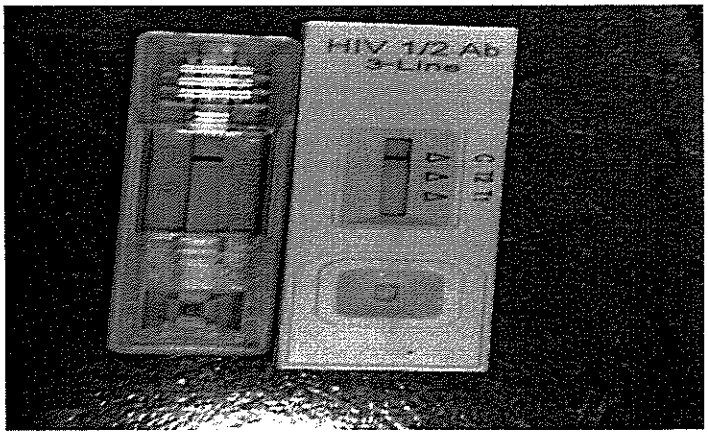
the presence of certain substances in urine and/or If certain substances' levels in urine are above or below normal levels With the colour changes, the urine dipstick will highlight the presence of compounds such as proteins, glucose, ketones, haemoglobin, and nitrites, Specific gravity and PH etc.



Mindray BC-30s Automated Hematology Analyzer

In Hematology I have learned how to operate these machines and ESR analyzer, Coagulation profile test. The tests which are conducted in these machines are RBC, WBC, Platelets and clotting factors etc.
In Serology there was most of work done by manually but most of I have used readymade kit which provided by Manufacturer Company. These tests were WIDAL, ASO, VDRL and Hiv tests.





Malaria rapid test kit **Hiv kit**

Malaria rapid diagnostic tests (RDTs) assist in the diagnosis of malaria by providing evidence of the presence of malaria parasites in human blood.
RDTs are lateral flow immuno-chromatographic antigen-detection tests, which rely on the capture of dye-labelled antibodies to produce a visible band on a strip of nitro-cellulose, often encased in plastic housing, referred to as cassettes. With malaria RDTs, the dye-labelled antibody first binds to a parasite antigen, and the resultant complex is captured

on the strip by a band of bound antibodies, forming a visible line (T - test line) in the results window. A control line (C - control line) gives information on the integrity of the antibody-dye conjugate, but does not confirm the ability to detect parasite antigen. Inside the cassette is a strip made of filter paper and nitrocellulose. Typically, a drop of blood is added to the RDT through one hole (A; sample well), and then a number of drops of buffer usually through another hole (B; buffer well). Buffer carries the blood along the length of the RDT.

Electrolyte analyser

Electrolyte panel tests were performed which measured the level of electrolytes such as Sodium, potassium, chloride and bicarbonate test.

Sonography Machine

I also learned how sonography performed. It is a medical imaging method that uses sound waves on a body's internal organs for testing, diagnostic, or therapeutic reasons. The gel which is applied to skin and the machine is used. The gel is ultrasound gel or coupling gel

and it is also a water based gel and has several purposes. The gel helps transmit the ultrasound waves between the transducers (the device that emits the ultrasound waves) and the patient's skin. It ensures efficient transmission of the sound waves and minimises air pockets that can interfere with imaging. The gel provides lubrication allowing the transducer to move smoothly over the skin during the imaging procedure.

I also learned about X-ray. They explained to me the process of x-ray. X-rays involve radiation that passes through the body, but can't feel it or see it with the naked eye. As x-rays pass through the body, different body parts absorb their energy at different rates. A detector on the other side of the body detects these x-rays once they've passed through, then turns them into an image visible on the screen.
X-rays have more difficulty passing through denser body parts, such as bone. As a result, these parts appear as white areas on the image. Softer body parts like the lungs and heart are easier for x-rays to pass through, showing up as darker areas. After that the radiologist interprets the x-ray image to evaluate the anatomy and detect any abnormality.
I shadowed pathologists during a gross examination and learned about their process identification of abnormalities.

This internship solidified my interest in research and helped me understand the crucial role a pathology lab plays in patient diagnosis and treatment.
My internship at Kaizen diagnostic Centre was an invaluable learning experience. I gained a deeper understanding of pathology and the vital role it plays in healthcare. I am grateful to the staff at Kaizen Diagnostics Centre, especially Sangeeta Bhardawj, for their guidance and support throughout this program.

[423 Sonali Gupta]

FINAL REPORT OF THE HANDS ON TRAINING ON KARYOTYPING

The training-workshop on karyotyping was conducted by the department of biotechnology during november 2023 to january 2024. The theory classes covered the basic aspect of the principle of Karyotyping, Genetic disorder,diagnosis, treatment and prevention along with the steps involved in karyotyping. The hands-on training on karyotyping was done in the Ramniranjan jhunjhunwala college Mumbai. 21 students enrolled for the Workshop. The students were grouped into four teams with each team comprising 5 students.

On the very 1st day we did Planting. Removed media, serum and PHA from freezer and kept media and serum in the water bath at 37° Leaved PHA at RT ,cleaned laminar hood with methanol swab. Put on the UV light in the laminar hood for 30 mins. Added 4 ml RPMI 1640 culture Medium of culture to the vial using 10 ml syringe then using A 5ml syringe, added 1 ml human serum/FBS and using a 100 microliter syringe, added PHA (0 .2 ml M and 0.01 ml P) into it. Using a 2ml Syringe added 8 drops of blood. Cleaned the mouth of the vials with methanol and closed the screw caps tightly. Kept the vial in a petri dish cleaned with methanol and kept in the CO2 incubator at 37 ° C for 72 hours. At the 72th hour add 0.1 ml of colchicine (10 ug /ml) to the vial. Mixed properly and incubated for 1 hour.

After that we started the termination procedure. In this procedure Centrifuge tubes and round bottom tubes were prepared and labelled accordingly. We removed the Vials from the incubator, and their contents were transferred to graduated glass centrifuge tubes with corresponding labels. Centrifugation was performed at 1000 rpm for 10 minutes. The supernatant was carefully removed, leaving the pellet behind. Pre-warmed KCL solution (0.560gms in 100ml) was added to each tube to bring the volume to 5ml. The mixture was thoroughly mixed and CO2 incubated at 37°C for 20 minutes.

After this we did Fixation :
Tubes were centrifuged again at 1000 rpm for 10 minutes.

Supernatant was discarded, and cell pellets were gently resuspended in appropriate buffers for downstream applications or fixation for karyotyping.
Then the next day, we removed tubes from the refrigerator, centrifuged, and gave 2-3 washes with fixative until the pellet became white. At the end, the supernatant was discarded, leaving behind fixative until 0.5 ml remained. The hot plate was set at 40°C, and acidified chilled slides (slides kept in cold water in the refrigerator) were taken. Then we mixed pellets thoroughly and dropped onto the cold slide from a height, then placed on the plate to heat dry. After drying, the slide was removed and we prepared Giemsa Stain

PREPARATION OF STOCK GIEMSA STAIN:
1gm of Giemsa powder and 50ml glycerol were taken. The Giemsa powder was ground slowly while adding glycerol to make it into a paste. Then, methanol was added slowly (50ml) to make a Giemsa stock. It was kept in the incubator at 37°C overnight. The next day, it was filtered through filter paper No.41 and preserved in the refrigerator to age for 1 month before use. After that slide was stained with plain Giemsa, and observed under the microscope. If an adequate number of good quality metaphases were achieved, it was considered a successful culture; otherwise, it was deemed a failure.

The last Step was G-Banding In which we prepared Four slides for each patient and aged for 2-3 days. The slides were kept overnight at 60°C in the oven the day before banding was done.
Buffer:

Buffer		
DW	=	200ml
Na2HPO4	=	450mg
KH2PO4	=	340mg

TEDTA

Trypsin	=	125mg
EDTA	=	125mg

10ml PBS+90ml D/W

WORKING GIEMSA STAIN:
43ml S.buffer
5 ml methanol
2 ml stock giemsa stain.

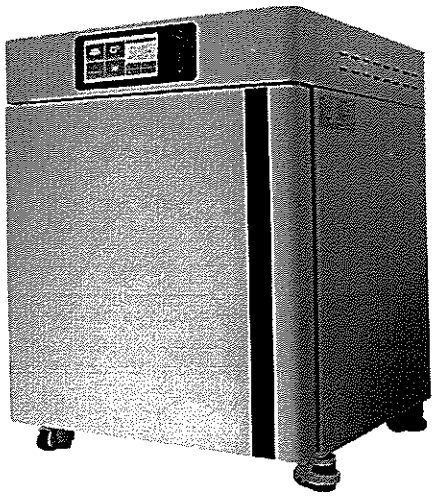
PBS 10X
Nacl = 8gms

KCL =0.3gm
Na2HPO4 2h2O =0.073 gms
KH2PO4 =0.020gm
Glucose =2gms
Dissolve in 100 ml D/W (10 X)
pH = 6.48

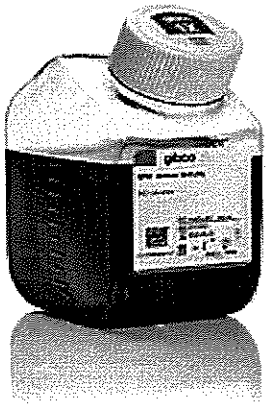
TEDTA solution was prepared and mixed with a magnetic stirrer on a vortex mixer. The buffer was kept at 60°C after taking out 43ml for the preparation of working Giemsa stains.

- A No.1 slide of each Student was taken in a petri dish, and S.buffer prewarmed at 60°C was poured until the slides were immersed. The petri dish was kept at 60°C for 15 minutes.
- Each slide was then rocked in the TEDTA mixture for a fixed time, removed, and rinsed in normal saline.
- The slides were stained and observed under the microscope. If good banding was not achieved, i.e., if over-trypsinized or if trypsin treatment was not sufficient, the time for the second batch of slides was adjusted accordingly.
- This procedure was repeated for all four slides of each Student.

We express gratitude to our Department of biotechnology for organising and conducting the hands-on karyotyping training program. We greatly appreciate the opportunity to participate in such an enriching and educational experience.



CO2 incubator



RPMI 1640 culture Med.

human serum/FBS