



Review Article

Medical Laboratory Science Technician - An Eye for a Physician

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Abstract

We have created a scientific world with our logical thinking and hard work. Who has proved anything, have understood its principle mechanisms. How does that thing affect our daily work? Our scientific field gives real information about anything which we are satisfied with. If we talk about our medical science field today, we have been able to gather a lot of information about our body anatomically and physiologically, treat and take care of the body scientifically manner. In the medical field, our physicians can diagnose almost any disease. But they should also know from their intensive experience weather whatever decision they have taken is the real cause of that disease are not and with what quality and quantity it has affected the patient and to prove or which is a symptom of the disease. He / She can also see symptoms in many different diseases. To prove this, they have to send the patient or the patient's sample to the diagnostic centre or laboratory. Thus, medical laboratory scientists play an important role in medical sciences.

Keywords: Medical laboratory Scientists, Disease diagnosis, MLT's decision, Phlebotomy and Phlebotomist, Blood collection etc

1. Introduction

Medical Laboratory Scientists is a person who works on accepted principles manually or automatically on specimens in the laboratory . A lab scientist studies any scientific investigation in great detail [Fig-1]. A lab scientist contributes to health care, research development, health industry, and education institutions. A lab scientist also contributes to the health care profession along with a physician. [1]

2. Devotional vs scientific era

Some things in today's a world run on two beliefs

One- About which we have not been able to get any information till now and no one has been able to prove anything related to it, We have been able to gather information only to a limited extent through our forward thinking and technical things. The information after that which is not yet proven is considered depend on **NATURE** . In other words, God dependent.

Other- We have created a scientific world with our logical thinking and hard work. Who has proved anything, have understood its principle mechanisms. How does that thing affect our daily work? Our scientific field gives real information about anything which we are satisfied with. If we talk about our medical science field today, we have been able to gather a lot of information about our body anatomically and physiologically, treat and take care of the body scientifically manner.[2]

Our medical field has become a very vast field. Like a huge densely branched tree and every branch plays an important role such as various specialist, diagnostic centre, pharmaceuticals, nurses, etc

3. Medical lab is an important branch of medical health service

Today we will talk about a very important branch. Which forms a backbone for medical health service. Which is medical lab technology.[3]

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Fig-1 A medical laboratory student investigates the specimen with Microscope



Fig-2 A medical laboratory student pipetting in medical lab

In the medical field, our physicians can diagnose almost any disease. But they should also know from their intensive experience whether whatever decision they have taken is the real cause of that disease are not and with what quality and quantity it has affected the patient and to prove or which is a symptom of the

disease. He / She can also see symptoms in many different diseases. To prove this, they have to send the patient or the patient's sample to the diagnostic centre or Lab [Fig-2].

Lab scientists working in the lab are diagnostic centre examine or study the sample and give a proven result. This proves to what extent the physician's hypothesis was correct.

4. Responsibility of MLS

Collecting, receiving, labelling, storing desired specimens and samples from the patient and studying them. [4] Testing the specimen in the lab according to standard procedures and accepted principles and interpreting the results. All the tests are done scientifically and every data should be scientifically verified. Paying special attention to safety in the lab while using of chemical instruments, flammable things, sharp things and infectious instruments and also proper discard of expiry dates of reagents, rapid kits and other things so that any danger like physical hazards, chemical hazards and biological hazards to the lab scientist, workers and patients remain safe [Fig-3]



Fig-3 A MLS student working in Laboratory with safety precautions using Laminar Air Flow.

Therefore, a medical lab scientist must have experience in many possible situations and also have complete

knowledge about the factors that excites him in the lab which he will carry forward.

The greatest responsibility of a medical lab scientist is to make all the processes of the lab reliable and optimized. The lab will be successful in giving significant results and a new change will come. [5]

5. Requirements and skill of MLS

Proven experience as lab technician or relevant position. Experience in operating electricals and non electricals, laboratory equipments like autoanalyzer [Fig-4], semiautoanalyzer manual and knowledge of potentially dangerous substances like flammable liquids or substances, infectious microorganisms or biochemical hazards.

a Excellent physical conditions and endurances.

b Working knowledge of database system.

c Ability to work autonomously and under the pressure.

d Valid laboratory technical license and degree in relevant subjects.



Fig-4 A Medical laboratory student work on Autoanalyzer to detect the electrolyte in the sample.

A great MLS needs to holds a solid background in science and research science much of their everyday work will addresses chemistry, biology and physiology fully understanding and these subjects in necessary but enthuse as it makes them fantastic at what they do [6].

6. Role of MLS

He / She is also known as clinical lab scientist

He / She is responsible for doing scientific study on the specimen and giving report to the physician.

A medical lab scientist studies the specimen very hard by using various instruments, microscope [Fig-5], analyzer, etc.

A medical lab scientist identifies clinical situations and plays an important role in providing treatment.

It has been estimated that 60% to 70% of decisions regarding proper diagnosis, treatment, hospitalization or discharge of any patient are made by medical lab scientists based on the results obtain, it is estimated. [7]



Fig-5 A MLS student studies the specimen very hard using Microscope

Following are also role in these field-

- ☑ Research and product development.
- ☑ Insurance underwriting.
- ☑ Forensic medicine.
- ☑ Forensic science.
- ☑ Peace Corps.
- ☑ Food, cosmetic and consumer-product testing labs.
- ☑ Medical product sales and marketing.[8]

7. Some facts about Medical Laboratory workers and departments

- ❖ Phlebotomy is defined as the collection of blood from the blood vessels-
 - Venous blood collection by venipuncture (Puncture of veins- Median Cubital vein, Cephalic vein, Basilic vein, Median vein etc).
 - Arterial blood collection by arterial puncture (Puncture of arteries- Radial artery of wrist, Femoral artery of thigh, Branchial artery of the arm)
 - Capillary blood collection by capillary puncture- Heel or toe for infants, Ear lobe, Middle or ring finger.
- ❖ A laboratory professional that is specialized in blood collection is known as a **Phlebotomist**.
- ❖ During blood collection, an incision is made on the skin. The skin has numerous microorganisms (Bacteria, Fungus, virus, protozoa, spors etc) . Proper disinfection (prior to collection) is the most important factor for safe phlebotomy. Because they cause the inaccurate results. [9]
- ❖ Some samples of substances naturally released from the body are also collected.
Exa. Semen , Sputum , Stool , Urine , Saliva , Oral fluid , sweat etc.
- ❖ There are some body samples that require special attention to confidentiality, personal or other limitations when collected, whether the patient is comfortable or not.
- ❖ There are some samples that the patient collects himself, we just need to give him instructions about the method and precautions for collection.[10]
Exa. Urine collection , Stool collection , Semen collection , etc.
- ❖ Generally, the patient should have a painless and pleasant experience at the time of samples collection, which gives a good impact.
- ❖ During the operation procedure the surgeon collects some body samples from the operation theatre.
Exa. Body Tissue sample , Body organ , Body organ's part etc.
- ❖ Every sample we collect must go through the most extreme conditions of collection, handling and sample processing. So that we can get very accurate results of microorganisms and other requirements from the sample.[11]
- ❖ The following things are necessary for good quality results:
 - Proper specimen selection
 - Proper specimen collection
 - Proper transport of specimen to the Laboratory
 - Proper testing procedures
 - Proper documentation etc.[12]

8. Relation between MLS and physician

A medical lab scientist or diagnostic centre work like an eye for a physician. It is as if we are 100% sure by looking at anything whether it is real or not. Due to which the patient gets proper treatment. Patients are also saved from many unwanted tests and other such as-

Even with time delay- Symptomatic treatment of patients (in some cases) or wrong treatment remains safe.

Drug side effect or treatment complications and unwanted treatment- Many medicines have many side effects on our body and it can also be used. Unnecessarily, so the patients remain safe.

A medical lab scientist or healthcare professional should have very good connection they should cooperate in the interest of the patient and in creating a new era and development by not bringing their level of education between the contact relation and they should respect to each other.

Our institution and hospital management department has to play a very important role. Which can be recognized by an intrinsic. This can provide proper convenience and benefits in a large geographical area , with this, even a MLS will understand the importance of his field.

Medical lab plays a very important role in monitoring, diagnosis and treatment of disease so that the physician gets information about the changes and improvement in every situation at all time.

With the service of the MLS, necessary plans are provided for the patient's treatment and the patient's conditions improves, significantly, ultimately, it become clear that a **MLS works as an eye for the physician** instead of the scientist.

9. Communication between MLS and physician

Physician and medical lab scientist should come face to face for contact in which, social, cultural, political, ethnic and economic reasons can not interfere.

A good communication very important for safety issues and correct information is passed on; so this mean that mistakes are avoided and the ensure all procedures and functions are works properly. [13]

10. Opportunity and outlook of job career in MLS's professions

The average salary of a medical lab scientist is quit decent. There is even more chance that the salary of a medical lab scientist may increase depending on the education, qualification, workplace and experience. There are lots of medical laboratory technicians and medical lab scientist job opportunities [Fig-6].

According to [Bureau of Labor Statistics](#) , at present the there is a shortage of Medical lab technician and

medical lab scientist in many parts of the country which guarantees adequate employment opportunities and higher salaries sometime degrees.

Job opportunities are expected to increase faster than average with the continued increase in the volume of laboratory tests due to the population growth.

More than 26000 new posts are likely to be available by 2030[14].

With additional training and experience, a medical lab scientist may become a department head and lab manager.

Others may also look for specialists to advance their careers. Hence a MLS plays very important role which helps in making the present era very advanced.



Fig-6 MLS employee in a medical laboratory work place.

11. Contribution of other paramedics in healthcare service

In today's modern era, our paramedics are an important component of healthcare service to save lives. A paramedic is a highly experienced, trained and skilled medical profession. Paramedics can diagnose, evaluate, and treat patient's diseases using various equipment and medication. They also contribute by giving advice to an individual or the entire community to avoid life-threatening diseases, infections etc and also explain the importance of vaccination. These contribute very significantly in various ways, be it emergency, pre-hospitalization, hospitalization or post-hospitalization conditions, thereby ensuring the best outcome of any patient. During emergencies, paramedics also provide rapid medical care by transporting patients to medical facilities. Due to which they are in great demand in the society as healthcare professionals. [15,16,17].

12. Conclusion

A medical laboratory science is a professional course. In today's time is our medical field without the involvement of medical laboratory and MLS. There should be proper diagnosis and proper treatment and the decision what we have to take regarding to the patient's disease are mostly affected and impossible.

MLT course or degree gives many benefits and opportunities to make your good identity at the any level like is-

☐ They become a specialist in various fields like-

1. Clinical Chemistry
2. Microbiology
3. Hematology
4. Immunology
5. Histopathology
6. Clinical Biochemistry
7. Parasitology etc

☐ They are mentorship for newcomers and juniors.

☐ They also get stable in governments jobs and non governments settings.

☐ Our government provides many vacancies in various structures-

RPMC, DRDO, PGMIR, ISRO, AIIMS, DHA, DSSSB, RAILWAY, SGPPI, ESIC, State NHM, RPMSC etc.

Medical laboratory is playing its important role in healthcare service. Apart from this, all the medical departments like medical courses, paramedical courses, nursing courses, pharmacy courses and other diploma courses together create medical health service and play their own special roles. All of them work hard day and night with various teams, which makes the technology of the medical field very advanced.[18]

Table-1 Allied health profession can take admission in various required degree courses or diploma courses-[19]

Degree Courses	Diploma courses
BMLT (BMLS)	DMLT
BRIT	D. Pharmacy
B. OPTOMETRY	GNM
BPT	ANM
BSc Nursing	D. X-ray
B. Pharmacy	D. MRI
B.A.S.L.P	DDT
BSc Radio Therapy Technology	DOT
BSc Respiratory Therapy	DETCT
B.O.T	D. CT
BSc Clinical Nutrition Course	D. CT Scan
BSc Neuro Electro Physiology	D. Dental Hygiene
BSc Cardio-Pulmonary Perfusion Technology	Diploma in Nursing Care Assistant
BSc Respiratory therapy	Diploma in ECG Technology
BSc Operation theatre & Anaesthesia technology	Diploma in Medical Record Technology
Etc.	Diploma in Health Inspector
	Etc.

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