

Medical Laboratory Technician



MEDICAL LABORATORY TECHNICIAN

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Structure and function of human body



Different parts of body:

The human body is the entire structure of a human being and comprises a head, neck, trunk (which includes the thorax and abdomen), arms and hands, legs and feet.

Every part of the body is composed of various types of cell. At maturity, the estimated number of cells in the body is given as 37.2 trillion.

The study of the human body involves anatomy and physiology.

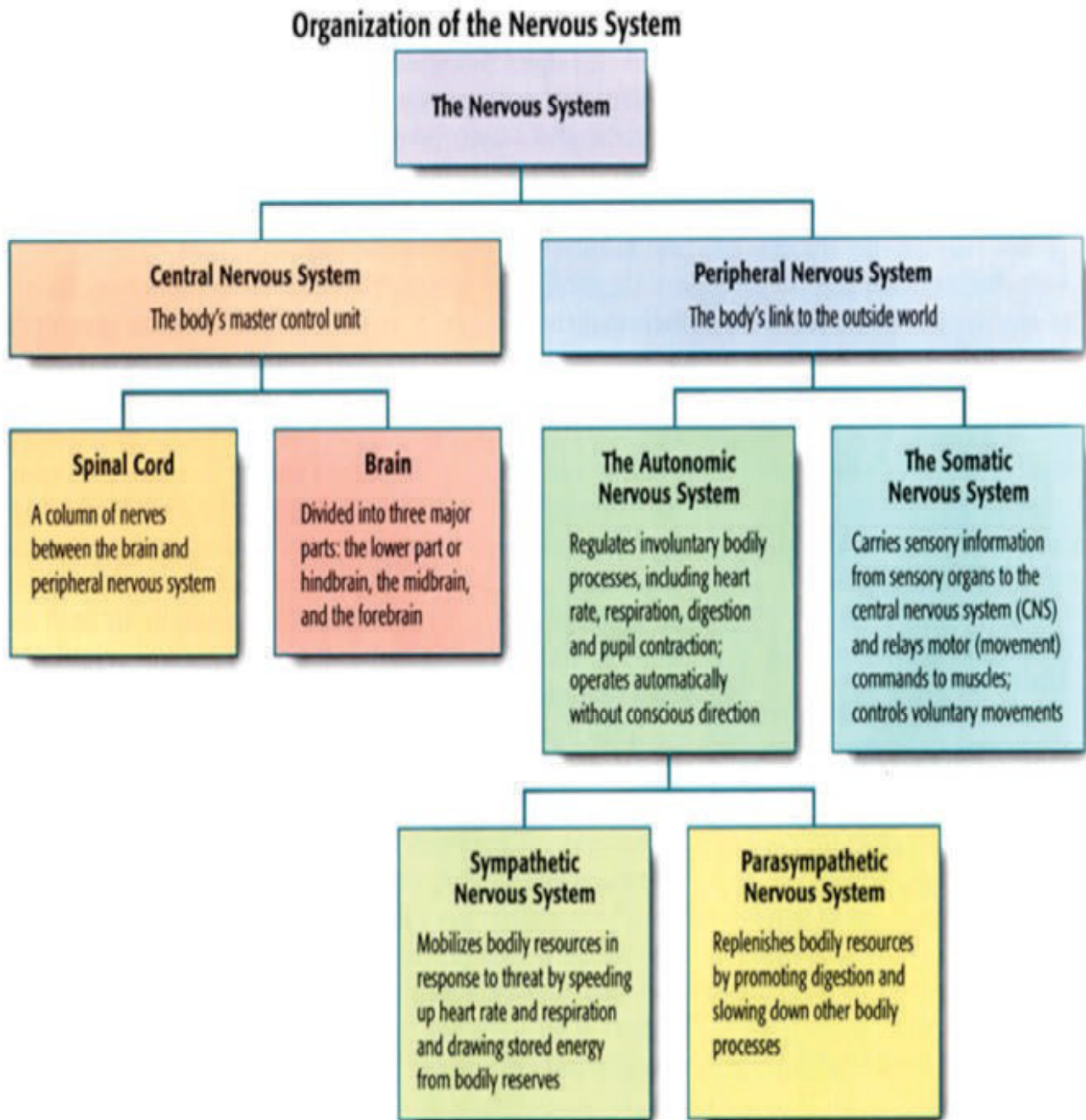
Anatomy is the study of the structure of animals and their parts.

Physiology focuses on the systems and their organs of the human body and their functions.

Composition of Human Body: Material and Chemical

Material:

- Muscle
- Fat
- Bone and teeth
- Brain and nerves
- Connective tissue
- Blood – 7% of body weight.
- Lymph
- Contents of digestive tract, including intestinal gas
- Urine
- Air in lungs.



Reproductive system:

Female reproductive system:

- The female reproductive system includes the ovaries, fallopian tubes, uterus, vagina, vulva, mammary glands and breasts.
- These organs are involved in the production and transportation of gametes and the production of sex hormones.
- The female reproductive system also facilitates the fertilization of ova by sperm and supports the development of offspring during pregnancy and infancy.

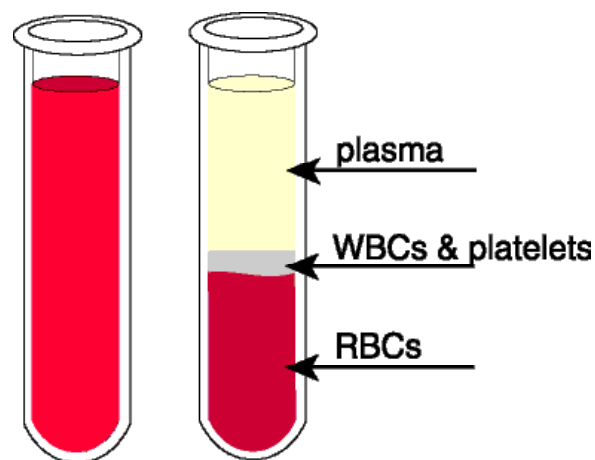
Module 2

- Perform procedures to collect blood samples, Study the samples for their use in the process of transfusion

- pillow or other support
- separate stoppers for opened vacuum tubes and non-vacuum tubes
- needle disposal box

The main components of blood include:

Plasma, Red blood cells, White blood cells, Platelets



For sample drawing the following equipment is needed



Blood sample drawing equipment

- needles (preferably vacutainer needles), size 20G to 22G
- tubes
- vacutainer holder
- tourniquet
- disinfection swabs
- micropore tape
- dental rolls
- adhesive dressing
- rubber gloves

- **Conducting the chemical analysis of body fluids, determine the presence of normal or abnormal components and understand how samples of body fluids are collected and analysed**

OVERVIEW OF BODY FLUID ANALYSIS

- In addition to accurate and timely test results, the laboratory must be prepared to inform the physician or other medical staff on normal values, reliability of test results including medications or other substances that could interfere and advise on proper specimen collection.
- Lab exam of body fluids
 - Physical characteristics
 - Chemical constituents
 - Morphologic elements
 - Culture for microorganisms
 - Ancillary studies

CEREBROSPINAL FLUID (CSF)

A. Composition and formation

- CSF is the third major fluid of the body
 - Adult total volume 140-170 ml
 - Neonate total volume 10-60 ml
- Subarachnoid space - area that lies between the arachnoid membrane and pia mater. Cerebrospinal fluid formed by the choroid plexus cells and ependymal cells occupies this space.

Blood Brain Barrier - restricts entry of macromolecules such as blood cells, large proteins, lipids. Therefore, the composition of CSF does not resemble plasma.
- Absorbed by the arachnoid villus

B. Functions

- To supply nutrients to the nervous tissue
- To remove metabolic wastes
- Serves as a mechanical barrier to cushion the brain and spinal cord against trauma

C. Indications

CSF analysis is performed to diagnose meningitis, intracranial hemorrhage (CVA), leukemias, malignancies, and central nervous system disorders.

D. Specimen Collection

- Routinely via lumbar puncture under sterile conditions
- Intracranial pressure measured
- Three sterile tubes collected
 - Tube 1 — Chemistry and serology
 - Tube 2 — Microbiology
 - Tube 3 — Hematology
- All CSF should be treated with extreme caution as they can be highly infectious.

They should always be considered STAT.

E. CSF Physical Characteristics /Appearance, and Gross Examination

- Normally crystal clear and colorless
- Descriptive terms used: clear, hazy, cloudy, turbid, bloody, xanthochromic. These terms should also be quantitated as slight, moderate, marked, or grossly.
- Other terms

A. Xanthochromic

- xanthochromia — term used only for CSF to describe a yellowing discoloration of the supernatant Body Fluids MLAB 1211! 5
- Causes
 - Usually an indication of the presence of old blood. RBCs have been present in the CSF for an extended period of time, have broken down, released their hemoglobin, and the Hgb has been converted to bilirubin
 - Elevated serum bilirubin
 - Carotene pigment, merthiolate contamination and increased proteins

- **Performing the standard procedure for cleaning the different parts using appropriate cleaning agents, Performing procedures to keep the unit sterile and functional Performance Criteria**

Introduction

Good laboratory technique demands clean glassware, because the most carefully executed piece of work may give an erroneous result if dirty glassware is used. In all instances, glassware must be physically clean; it must be chemically clean; and in many cases, it must be bacteriologically clean or sterile. All glassware must be absolutely grease-free. The safest criteria of cleanliness is uniform wetting of the surface by distilled water. This is especially important in glassware used for measuring the volume of liquids. Grease and other contaminating materials will prevent the glass from becoming uniformly wetted. This in turn will alter the volume of residue adhering to the walls of the glass container and thus affect the volume of liquid delivered. Furthermore, in pipets and burets, the meniscus will be distorted and the correct adjustments cannot be made. The presence of small amounts of impurities may also alter the meniscus.

Cleaning

Wash labware as quickly as possible after use. If a thorough cleaning is not possible immediately, put glassware to soak in water.

If labware is not cleaned immediately, it may become impossible to remove the residue.

Most new glassware is slightly alkaline in reaction. For precision chemical tests, new glassware should be soaked several hours in acid water (a 1% solution of hydrochloric or nitric acid) before washing.

Brushes with wooden or plastic handles are recommended as they will not scratch or abrade the glass surface.

Glassware Cleaners

When washing, soap, detergent, or cleaning powder (with or without an abrasive) may be used. Cleaners for glassware include Alconox®, Dural®, M&H®, Lux®, Tide® and Fab®. The water should be hot. For glassware that is exceptionally dirty, a cleaning powder with a mild abrasive action will give more satisfactory results. The abrasive should not scratch the glass. During the washing, all parts of the glassware should be thoroughly scrubbed with a brush. This means that a full set of brushes must be at hand—brushes to fit large and small test tubes, burets, funnels, graduates and various sizes of flasks and bottles. Motor driven revolving brushes

are valuable when a large number of tubes or bottles are processed. Do not use cleaning brushes that are so worn that the spine hits the glass. Serious scratches may result. Scratched glass is more prone to break during experiments. Any mark in the uniform surface of glassware is a potential breaking point, especially when the piece is heated. Do not allow acid to come into contact with a piece of glassware before the detergent (or soap) is thoroughly removed. If this happens, a film of grease may be formed.

Safe Use of Chromic Acid

If glassware becomes unduly clouded or dirty or contains coagulated organic matter, it must be cleansed with chromic acid

cleaning solution

The dichromate should be handled with extreme care because it is a powerful corrosive and carcinogen.

When chromic acid solution is used the item may be rinsed with the cleaning solution or it may be filled and allowed to stand.

The length of time it is allowed to stand depends on the amount of contamination on the glassware. Relatively clean glassware may require only a few minutes of exposure; if debris is present, such as blood clots, it may be necessary to let the glassware stand all night. Due to the intense corrosive action of the chromic acid solution, it is good practice to place the stock bottle, as well as the glassware being treated, in flat glass pans or pans made from lead or coated with lead, or plastic polymer pans determined compatible with the concentration of chromic acid you are using. Extra care must be taken to be sure chromic acid solution is disposed of properly.

Special types of precipitates may require removal with nitric acid, aqua regia or fuming sulfuric acid. These are very corrosive substances and should be used only when required.

Removing Grease

Grease is best removed by boiling in a weak solution of sodium carbonate. Acetone or any other fat solvent may be used. Strong alkalis should not be used. Silicone grease is most easily removed by soaking the stopcock plug or barrel for 2 hours in warm decahydronaphthalene.

Drain and rinse with acetone or use fuming sulfuric acid for 30 minutes. Be sure to rinse off all of the cleaning agents.

PROVIDE INFORMATION ABOUT TEST RESULTS

Module 5

- **Providing information to the people, providing appropriate and relevant information about the tests he conducts as and when required.**

A comprehensive metabolic panel (CMP) is a blood test that measures your sugar level, electrolyte and fluid balance, plus kidney and liver function. Our CBC/chemistry profile also includes a lipid panel and complete blood count (CBC) so you have the opportunity to detect signs of heart disease, anemia, clotting, and immune disorders, as well as metabolic conditions that could threaten your health.

Instructions

This test may be done fasting or 2-6 hours after eating. Both ways provide valuable information, though 2-6 hours after a meal provides a more realistic assessment of the state of your blood in everyday life. Stay hydrated and take your medications as prescribed.

Blood Sugar:

- **Fasting glucose**

Kidney Function:

- Uric acid
- BUN (blood urea nitrogen)
- Creatinine
- BUN/creatinine ratio
- eGFR (estimated glomerular filtration rate)

Electrolytes and Minerals:

- Sodium
- Potassium
- Chloride
- Calcium
- Phosphorus
- Iron

Liver Function:

- Total protein
- Albumin
- Globulin

- Albumin/globulin ratio
- Bilirubin
- Alkaline phosphatase
- LDH (lactate dehydrogenase)
- AST (aspartate aminotransferase)
- ALT (alanine transaminase)

Lipid Profile:

- Total cholesterol
- Triglycerides
- HDL cholesterol
- LDL cholesterol (calc.)
- VLDL cholesterol (calc.)
- Total cholesterol/HDL ratio
- Estimated CHD risk

Complete Blood Count:

- Red blood cell count
- Hemoglobin
- Hematocrit
- MCV (mean corpuscular volume)
- MCH (mean corpuscular hemoglobin)
- MCHC (mean corpuscular hemoglobin concentration)
- RDW (red blood cell distribution)
- White blood cell count
- Differential count
- Platelet count

A comprehensive metabolic panel (CMP) is a blood test that measures your sugar level, electrolyte and fluid balance, plus kidney and liver function. Our CBC/chemistry profile also includes a lipid panel and complete blood count (CBC) so you have the opportunity to detect signs of heart disease, anemia, clotting, and immune disorders, as well as metabolic conditions that could threaten your health.

Establish and monitor quality assurance programs

Periodically monitoring the practices of laboratory, maintaining a comparable quality among competitors of the laboratory test results

The Good Clinical Laboratory Practices concept possesses a unique quality, as it embraces both the research and the clinical aspects of GLP.

Due to the ambiguity of some parts of the CFR regulations, the GCLP standards are described by merging guidance from regulatory authorities as well as other organizations and accrediting bodies, such as the College of American Pathologists (CAP), and the International Organization for Standardization. The British Association of Research Quality Assurance (BARQA) took a similar approach by combining Good Clinical Practice (GCP) and GLP in 2003

Standards for Organization and Personnel

Appropriately trained and well organized laboratory staff are key to the successful operation of a research facility. Systems are required to drive organizational structure, training and ongoing competency assessment to ensure appropriate accountability and communication during study conduct.

Required Activities and Documentation

All personnel must receive direct and detailed training for the performance of all duties and tasks that they perform. Competency assessments must be conducted and recorded for all components of the employee's training and functional responsibilities upon completion of initial training. A clinical laboratory continuing education program that is adequate to meet the needs of all personnel must be documented, and evidence of ongoing adherence by all laboratory personnel must be readily available

Quality Control Program

The laboratory director or designee should be actively involved in the design, implementation, and oversight of a site-specific, written QC program which defines procedures for monitoring analytic performance and consistent identification, documentation, and resolution of QC issue. This is so as to be able to detect immediate errors as well as changes that occur over time and hence assure the accuracy and reliability of test results, particularly if the data are used for patient management or product advancement decisions. In addition, the laboratory director and/or designee must determine the number and frequency of QC tests, as well as the appropriate QC materials to use. The quality control

program supports functions in the following areas: Test standards and controls, reagents, test specimens, review of quality control data, quality control logs, labeling of quality control materials and reagents, inventory control, parallel testing, and water quality testing.

Tests control

The laboratory must maintain and document acceptance criteria to test specimens and must follow site-specific instructions defined in the QC plan to routinely monitor analytic performance and to identify, document and resolve QC analytical problems. The laboratory must report results of specimen testing after ensuring data integrity, quality, and accuracy as described in the QC plan. The latter also specifies how the laboratory must proceed when changes of critical analytes occur; how QC logs must document control results from tested specimens; how all QC materials and reagents must be prepared, labeled and stored following the manufacturer's specifications; how an inventory control system must be established and followed to maintain continuous supply of reagents and materials; how parallel testing for new lots of reagents must be conducted to bridge with existing reagents; and how to test water quality to ensure that it meets defined tolerance limits as set forth by the testing requirements.

Review of Quality Control Data

QC must be performed and acceptable results obtained (as defined in the written QC program) before test results are reported to ensure quality and accuracy of all aspects of the work performed and reported. QC must also be run and reviewed after a change of analytically critical reagents, major preventive maintenance/service, or change of a critical instrument component. The laboratory personnel performing the testing must use the laboratory's QC program as a guide for selecting the appropriate corrective action to take for QC data that falls outside of established tolerance limits. Records should include detailed information of actions taken leading to resolution and include staff initials and dates. The laboratory must ensure a corrective action log is present to facilitate documentation and resolution of QC failures. In the event the QC data is determined to be unacceptable, the laboratory must re-evaluate all study-participant test results since the last acceptable test run to determine if a significant clinical difference has occurred, in which case, the instrument QC should be re-established and the affected testing repeated.

Quality Control Logs

QC logs must document control results assayed with each test to determine the acceptability of the QC run and to aid

Supervise and guide other laboratory Personnel

A medical laboratory is a place where tests are done on clinical specimens and samples in order to get information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease.

Laboratory Services play a critical role in the detection, diagnosis and treatment of disease. Samples are collected and examination and analysis of body fluids, tissue and cells are carried out. Main services are:

To Perform diagnostic test

To Identify organisms, like E-coli bacteria

To Count and classify blood cells to identify infection or disease

To Operate complex diagnostic equipment

To Perform immunological tests to check for antibodies

To Type and cross-match blood samples for transfusions

To Analyze DNA

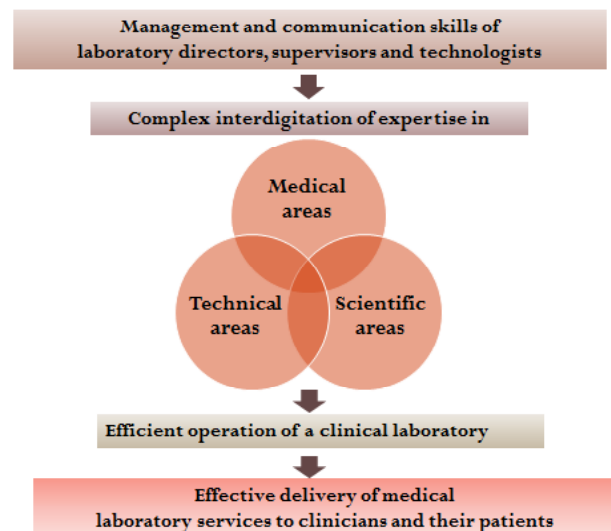
Medical Laboratory Services (Laboratory results) are essential to all aspects of health care and they should be:

- accurate,
- reliable,
- and timely

70% of clinical medicine decision making is predicated upon, or confirmed by medical laboratory test results

If inaccurate results are provided, the consequences can be very significant including:

- Unnecessary treatment
- Treatment complications
- Failure to provide the proper treatment
- Delay in correct diagnosis
- Additional and unnecessary diagnostic testing



- The efficient operation of a clinical laboratory and the effective delivery of medical laboratory services to clinicians and their patients require a complex interdigitation of expertise in medical, scientific and technical areas
- Although the medical, scientific, and technical expertise are essential pre-requisites for the provision of medical laboratory service, success in applying these techniques to benefit patient care is vitally dependent on:
 - the management and communication skills of laboratory directors, supervisors and technologists
- Laboratory management task is to integrate and coordinate organizational resources so that quality laboratory services can be provided as effectively and efficiently as possible
 - Organizational resources include personnel, equipment, money, time and space

Following element should be considered during management program in laboratory:

- 1) Selection and purchasing
- 2) Installation
- 3) Calibration and performance evaluation
- 4) Maintenance
- 5) Troubleshooting

Conduct research under guidance

- **Conducting research under the direction and guidance of Microbiologist or Biochemist**

There is no one best way to undertake research, no universal method that applies to all scientific investigations. Accepted practices for the responsible conduct of research can and do vary from discipline to discipline and even from laboratory to laboratory. There are, however, some important shared values

for the responsible conduct of research that bind all researchers together, such as so what can we use research to do in order to gain this new knowledge?

Some of the ways it can be used one to:

Categorise. This involves forming a typology of objects, events or concepts, i.e. a set of names or 'boxes' into which these can be sorted. This can be useful in explaining which 'things' belong together and how.

Describe. Descriptive research relies on observation as a means of collecting data. It attempts to examine situations in order to establish what is the norm, i.e. what can be predicted to happen again under the same circumstances.

Explain. This is a descriptive type of research specifically designed to deal with complex issues. It aims to move beyond 'just getting the facts' in order to make sense of the myriad other elements involved, such as human, political, social, cultural and contextual.

Evaluate. This involves making judgements about the quality of objects or events. Quality can be measured either in an absolute sense or on a comparative basis. To be useful, the methods of evaluation must be relevant to the context and intentions of the research.

Compare. Two or more contrasting cases can be examined to highlight differences and similarities between them, leading to a better understanding of phenomena.

Correlate. The relationships between two phenomena are investigated to see whether and how they influence each other.

RESEARCH BASICS 9

relationship might be just a loose link at one extreme or a direct link when one phenomenon causes another. These are measured as levels of association.

Predict. This can sometimes be done in research areas where correlations are already known. Predictions of possible

future behaviour or events are made on the basis that if there has been a strong relationship between two or more characteristics or events in the past, then these should exist in similar circumstances in the future, leading to predictable outcomes.

Control. Once you understand an event or situation, you may be able to find ways to control it. For this you need to know what the cause and effect relationships are and that you are capable of exerting control over the vital ingredients. All of technology relies on this ability to control.

You can combine two or more of these objectives in a research project, with sometimes one objective needing to be successfully achieved before starting the next, for example you usually need to be able to explain how something happens before you can work out how to Control it.

RESEARCH DESIGNS

There are numerous types of research design that are

- Understand the need and importance of research and the protocols for conducting the same

A protocol or a synopsis of a research project is a document submitted to an authority or an institution for the purpose of

1. Ethical clearance
2. Formal registration to universities for the award of a degree or doctorate
3. Peer review
4. Financial assistance from organizations like ICMR, DST, NACO, DGHS, and MHRD

Synopsis is the gist of your planned project submitted for approval from competent authorities. It gives a panoramic view of your research for quick analysis by the reviewers.

Thus, a protocol or a synopsis forms an integral part of a research project or a thesis. Many universities have made it mandatory for the postgraduate degree student to prepare a thesis as a part of their postgraduate training. A good knowledge about how a protocol or a synopsis is written is imperative to all people involved in medical research.

Literally, protocol (Greek word, protokollon - first page) means a format procedure for carrying out a scientific research. Synopsis (Greek word, sun - together, opsis - seeing) means brief summary of something. Frequently, both the terms are used as synonyms but the term 'synopsis' is used more often.

ASSIST IN FINE NEEDLE ASPIRATION CYTOLOGY

Definition

Fine-needle aspiration (FNA) is an invasive procedure used to analyse lumps or masses. In this procedure, a thin (23-25 gauge), hollow needle is inserted into the mass for sampling of cells that, after being stained, will be examined under a microscope (biopsy). This technique is called as fine-needle aspiration biopsy (FNAB) or fine-needle aspiration cytology (FNAC)

Purpose of FNAC

- FNAC can provide useful information to help to decide on appropriate therapy for condition.
- It can also be therapeutic for some lesions such as cysts or abscesses, and in many instances will alleviate the need for an open surgical biopsy.

ADVANTAGES OF FNAC

Advantages include:

- No requirement for anesthesia.
- No hospitalization is required.
- It is easy to perform and is least invasive.
- It is economical.
- It has better patient compliance.
- The results are extremely satisfactory in good hands.
- The exact cytological diagnosis is available before any definitive surgery is planned.

COMMON AREAS FOR ASPIRATION

Most fine needle aspirations are done on:

- Breast
- thyroid gland lymph nodes in the neck
- soft tissue swellings
- any other lump accessible by a needle

Indications

- Thyroid Gland
- Neck lymph nodes

- Neck cysts
- Salivary glands (i.e. parotid gland, submandibular gland)
- Inside the mouth
- Any lump that can be felt

Lumps that are found on imaging tests (such as ultrasound) even if they can't be felt

Patient preparation

Several preparations may be necessary before this procedure.

- No use of aspirin or non-steroidal anti-inflammatory medications (e.g. ibuprofen, naproxen) for one week before the procedure;
- No food intake a few hours before the procedure;
- Routine blood tests (including clotting profile) must be completed two weeks before the biopsy;
- Suspension of blood anticoagulant medications;
- Antibiotic prophylaxis may be instituted.

Before the procedure is started, vital signs (pulse, blood pressure, temperature, etc.) may be taken.

depending on the nature of the biopsy, an intravenous line may be placed. Very anxious patients may want to be given sedation through this line. For patients with less anxiety, oral medication (Valium) can be prescribed to be taken before the procedure.

Evaluating the Patient History of Symptoms:

Taking a patient history of symptoms is facilitated with mnemonic "OPQRST":

- Onset
- Who first noticed the condition?
- What was the patient doing / what was going on when the symptoms became apparent (e.g. trauma to the area, concurrent infections?)
- Was the onset sudden, gradual, or appears to be chronic
- Provocation or Palliation
- Whether any movement, palpation, medications,

ACT WITHIN THE LIMITS OF ONE'S COMPETENCE AND AUTHORITY

Module 12

ACT WITHIN THE LIMITS OF ONE'S COMPETENCE AND AUTHORITY

Roles of MLT

The MLT may function alone or as a member of a multimember team. Tasks, which the MLT may perform, include the following:

- Receive calls from a dispatcher, verbally acknowledge the call, read road maps, assist in the identification of the most expeditious route to the scene, and observe traffic ordinances and regulations enroute to and from the emergency scene.
- Upon arrival at the scene, insure the vehicle is parked in a safe location; perform a size-up to determine scene safety, mechanism of injury or illness, determine the total number of patients, and request additional help if necessary.
- In the absence of law enforcement, create a safe environment for the protection of the injured and those assisting in the care of patient(s).
- Determine the nature and extent of illness or injury, take pulses, blood pressure by auscultation palpation, visually observe changes in skin color, and establish a priority for emergency care. Based on assessment findings, render emergency care to adults, infants, and children.
- Establish and maintain an airway, ventilate patients, perform cardiac resuscitation, use automated external defibrillators, provide prehospital emergency care of single and multiple system trauma such as controlling hemorrhage, treatment of shock (hypoperfusion), bandaging wounds, and immobilization of painful swollen and deformed extremities.
- Manage medical patients to include assisting in childbirth, management of respiratory, cardiac, diabetic, allergic, behavioral and environmental emergencies, and suspected poisonings.
- Search for medical identification emblems, bracelets, or cards that provide emergency care information. Additional care is provided based on assessment of the patient and obtaining past medical information.
- Assist patients with prescribed medications including sublingual nitroglycerine, epinephrine auto injectors, and hand-held aerosol inhalers.
- Administer oxygen, oral glucose, and activated charcoal.
- Reassure patients and bystanders by working in a confident, efficient manner and avoid mishandling patients and undue haste while working expeditiously.
- Where extrication is required, assess the extent of injury and give all possible emergency care and protection to the patient. Use recognized techniques and equipment to remove patients safely.
- Radio dispatchers for additional help as necessary. Following extrication, provide additional medical care and triage injured victims in accordance with standard emergency procedures.
- Comply with regulations on the handling of crime scenes and prehospital death by notifying appropriate authorities and arrange for protection of property and evidence.
- Carry and lift the stretcher, placing it in the ambulance and see that the patient and stretcher are secured. Continue care enroute to the appropriate facility.
- Determine the most appropriate facility for patient transport unless otherwise directed by medical control. Report the nature and extent of injuries, the number of patients being transported, and the destination of patients to ensure prompt medical care in accordance with local protocols.
- Observe and reassess the patient enroute, and administer care as directed by medical control. Assist with lifting and moving the patient and appropriate equipment from the ambulance into the emergency facility.
- Report verbally and in writing, observations and emergency treatment given to the patient, at the scene and in transit, to the receiving staff for record keeping and diagnostic purposes. Upon request, provide assistance to the receiving facility staff.
- After completion of the call, restock and replace care supplies, clean all equipment following appropriate decontamination and cleaning

WORK EFFECTIVELY WITH OTHERS

The Laboratory department is a busy environment where lives are at risk and:

- the needs of individual patients must be met
- patient flow must be maintained
- adequate supervision of junior staff must be provided
- consultants must be communicated with
- the phone must be answered
- as well as numerous other tasks that must be performed!

KEY STEPS TO MANAGING A BUSY LABORATORY DEPARTMENT

1. manage risk in a defensible fashion and avoid solving non-Laboratory problems
2. communicate with patients
3. communicate other LD and non-LD staff
4. deal with admitting teams in a professional manner
5. constantly monitor departmental flow
6. manage your time
7. streamline the management of uncomplcat LD patients
8. be an administrator and a delegator
9. be a space administrator
10. be cognizant of the LD philosophy

COMMUNICATE WITH PATIENTS



Develop a good rapport

- Be professional, be friendly, be interested, shake hands, use people's names and involve the whole family.
- This is good manners, helps with the 'healing process' and means you're less likely to get sued.
- Apologize when appropriate.
- Make sure you know who the patient is if the cubicle is crowded with family!

Get interpreters early

- Anticipate the need for interpreters
- Do what you can without them but don't waste time.

Focused exploration of the presenting complaint

- Aim to solve problems, use a focused history to get the information you need to know.

Make multiple short visits to the patient's bedside

- This is very important – it helps patient's take in and accept information, strengthens the patient-doctor relationship and keeps the patient up-to-date with progress.

Anticipate the outcome and communicate expectations to patients early

- patients get frustrated with the uncertainty of not knowing what they might have and not knowing when or whether they will be able to go home from the LD.
- Give the patient a time frame (always slightly over-estimate) for when investigations will occur and when decision nodes will arise, and what the possible outcomes will be.
- Anticipate these outcomes by lining up other services in advance, e.g. social work, 'settling in' services, etc.

Don't delay uncomfortable decisions

- If its inevitable, deal with it now!

MANAGE WORK TO MEET REQUIREMENTS

This can be achieved by proper time management proper recording of the data, act with in the limit,

Utilize time effectively

- Time Management refers to managing time effectively so that the right time is allocated to the right activity.
- Effective time management allows individuals to assign specific time slots to activities as per their importance.
- Time Management refers to making the best use of time as time is always limited.
- Ask yourself which activity is more important and how much time should be allocated to the same? Know which work should be done earlier and which can be done a little later.
- Time Management plays a very important role not only in organizations but also in our personal lives.

Time Management includes:

- Effective Planning
- Setting goals and objectives
- Setting deadlines
- Delegation of responsibilities
- Prioritizing activities as per their importance
- Spending the right time on the right activity

Effective Planning

Plan your day well in advance. Prepare a To Do List or a "TASK PLAN". Jot down the important activities that need to be done in a single day against the time that should be allocated to each activity. High Priority work should come on top followed by those which do not need much of your importance at the moment. Complete pending tasks one by one. Do not begin fresh work unless you have finished your previous task. Tick the ones you have already completed. Ensure you finish the tasks within the stipulated time frame.



Setting Goals and Objectives

Working without goals and targets in an organization would be similar to a situation where the captain of the ship loses his way in the sea. Yes, you would be lost. Set targets for yourself and make sure they are realistic ones and achievable.

Setting Deadlines

Set deadlines for yourself and strive hard to complete tasks ahead of the deadlines. Do not wait for your superiors to ask you everytime. Learn to take ownership of work. One person who can best set the deadlines is you yourself. Ask yourself how much time needs to be devoted to a particular task and for how many days. Use a planner to mark the important dates against the set deadlines.

Delegation of Responsibilities

Learn to say "NO" at workplace. Don't do everything on your own. There are other people as well. One should not accept something which he knows is difficult for him. The roles and responsibilities must be delegated as per interest and specialization of employees for them to finish tasks within deadlines. A person who does not have knowledge about something needs more time than someone who knows the work well.

Prioritizing Tasks

Prioritize the tasks as per their importance and urgency. Know the difference between important and urgent work. Identify which tasks should be done within a day, which all should be done within a month and so on. Tasks which are most important should be done earlier.

Spending the right time on right activity

Develop the habit of doing the right thing at the right time. Work done at the wrong time is not of much use. Don't waste a complete day on something which can be done in an hour or so. Also keep some time separate for your personal calls or checking updates on Facebook or Twitter. After all human being is not a machine.

For Effective Time Management one needs to be:

Organized - Avoid keeping stacks of file and heaps of paper at your workstation. Throw what all you don't need. Put important documents in folders. Keep the files in their respective drawers with labels on top of each file. It saves time which goes on unnecessary searching.

Don't misuse time - Do not kill time by loitering or gossiping around. Concentrate on your work and finish assignments on time. Remember your organization is not paying you for playing games on computer or peeping into other's cubicles.

MAINTENANCE OF A SAFE, HEALTHY, AND SECURE WORKING ENVIRONMENT

Hazard

A hazard is a situation that poses a level of threat to life, health, property, or environment. Hazards can be dormant or potential, with only a theoretical risk of harm.

Occupational Hazard

A risk accepted as a consequence of a particular occupation.

Occupational Hazards

Depending upon the occupation an industrial worker may be exposed to five types of hazards:-

- A. Physical Hazards
- B. Chemical Hazards
- C. Biological Hazards
- D. Mechanical Hazards
- E. Psychosocial Hazards

TYPES OF OCCUPATIONAL HAZARDS

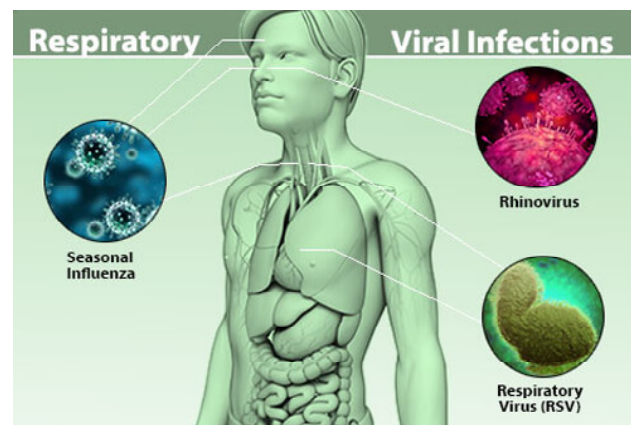
- Infections
- Slips/Falls
- N S I
- Latex Allergy
- B M W
- Chemical Exposure
- Repetitive Strain Injury
- Stress
- Fire Hazard
- Hazardous Spill
- Radiation
- Work Place Violence

Measures To Avoid Occupational hazards

Infections

- Hand wash a must
- Cover cuts with bandages and wear gloves for added protection (cuts are very vulnerable to infections).
- Artificial nails and chipped nail polish have been associated with an increase in the number of bacteria on the fingernails. Be sure to clean the nails properly

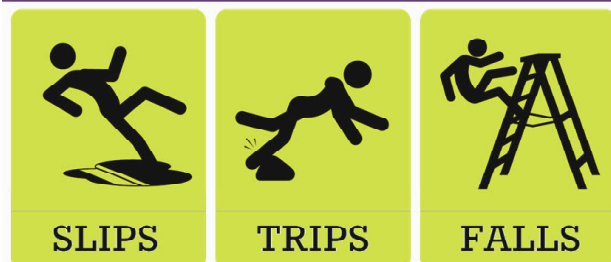
- Keep your hands away from your eyes, nose or mouth.
- Assume that contact with any human body fluids is infectious
- Use the Liquid soap in disposable containers . If using reusable containers, they should be washed and dried before refilling.



Slips/Falls

- Well Illuminated Floors, platforms, and walkways reasonably free of oil, grease, or water.
- Anti Skid Mats, Grates, or other methods that provide equivalent protection to be used on slippery surfaces.
- Slip-resistant floor coatings to be used in areas that are likely to get wet or subject to frequent spills.
- Guardrails on all open sides of unenclosed elevated locations.

IMPACT OF SLIPS, TRIPS & FALLS



Needle Stick Injury/Sharps Injury

- Do not recap needles
- Place a sharps disposal container close to the procedure area.

CODE OF CONDUCT OF HEALTH CARE PROVIDER

1. Be accountable

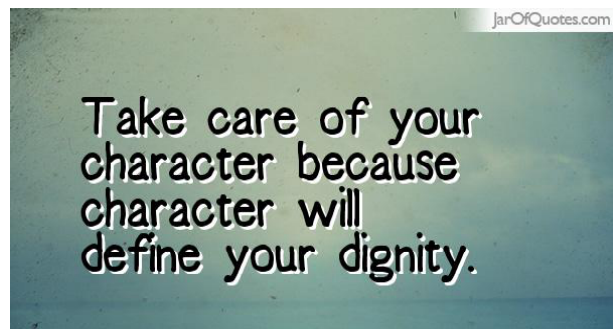
1. be honest with yourself and others about what you can do, recognize your abilities and the limitations of your competence and only carry out or delegate those tasks agreed in your job description and for which you are competent.
2. always behave and present yourself in a way that does not call into question your suitability to work in a health and social care environment.



3. be able to justify and be accountable for your actions or your omissions – what you fail to do.
4. always ask your supervisor or employer for guidance if you do not feel able or adequately prepared to carry out any aspect of your work, or if you are unsure how to effectively deliver a task.
5. tell your supervisor or employer about any issues that might affect your ability to do your job competently and safely. If you do not feel competent to carry out an activity, you must report this.
6. establish and maintain clear and appropriate professional boundaries in your relationships with people who use health and care services, carers and colleagues at all times.
7. never accept any offers of loans, gifts, benefits or hospitality from anyone you are supporting or anyone close to them which may be seen to compromise your position.
8. comply with your employers' agreed ways of working.

9. report any actions or omissions by yourself or colleagues that you feel may compromise the safety or care of people who use health and care services and, if necessary use whistleblowing procedures to report any suspected wrongdoing

2. Promote and uphold the privacy, dignity, rights, health and wellbeing of people who use health and care services and their careers at all times



1. always act in the best interests of people who use health and care services.
2. always treat people with respect and compassion.
3. put the needs, goals and aspirations of people who use health and care services first, helping them to be in control and to choose the healthcare, care and support they receive.
4. promote people's independence and ability to self-care, assisting those who use health and care services to exercise their rights and make informed choices.
5. always gain valid consent before providing healthcare, care and support. You must also respect a person's right to refuse to receive healthcare, care and support if they are capable of doing so.
6. always maintain the privacy and dignity of people who use health and care services, their carers and others.
7. be alert to any changes that could affect a person's needs or progress and report your observations in line with your employer's agreed ways of working.
8. always make sure that your actions or omissions do not harm an individual's health or wellbeing. Never abuse, neglect, harm or exploit those who use health and care services, their carers or your colleagues.
9. challenge and report dangerous, abusive, discriminatory or exploitative behaviour or practice.

BIOMEDICAL WASTE MANAGEMENT:

INTRODUCTION:

The waste is produced in the course of health care activities carries a higher potential for infection and injury than any other type of waste. Therefore it is essential to have safe and reliable method of its handling.

Inadequate and appropriate handling of health care waste may have serious public health consequences and a significant impact on the environment. Appropriate management of health care waste is thus a crucial component of environmental health protection and it should become an integral feature of health care services.

DEFINITIONS:

- According to biomedical management and handling rules 1998 of India, Biomedical means any waste which is generated during the diagnosis, treatment, or immunization of human beings or animals, or in research activities pertaining to or in the population or testing of biological.
- It is the waste generated by health care establishments, research facilities and laboratories. Waste may be generated during,
- Diagnosis, treatment of a disease and immunization for disease.
- Associated biomedical research and
- Production and testing of biological.

Classification:

In India, MoEF, GoI (1998) has notified Bio-medical Waste (management & Handling) Rules -1998, which describes ten categories viz.,

1. Human Anatomical Waste
2. Animal Waste
3. Microbiology Waste
4. Biotechnology Waste

5. Waste Sharps
6. Discarded Medicines
7. Cytotoxic Drugs
8. Solid Waste
9. Liquid Waste
10. Incineration Ash and Chemical Waste

Many regulatory definitions of regulated medical waste are based on ten broad categories defined in a 1986 EPA guide on infectious waste management. The ten categories are:

1. Cultures and Stocks
2. Anatomical Wastes (or Human Pathological Wastes)
3. Human Blood and Blood Products
4. Other Bodily Fluids
5. Sharps
6. Animal Wastes
7. Isolation Wastes
8. Contaminated Medical Equipment
9. Surgery Wastes
10. Laboratory Wastes and Dialysis Wastes (HCWH, 2001).

Segregation:

Biomedical waste from the hospitals needs to be segregated prior to disposal.

Infection - It is defined as Invasion and multiplication of microorganisms in body tissues.

Pathogens - Microorganisms that cause infection .E.g., Bacteria, virus, fungi etc.,

Medical Asepsis

Medical asepsis, or clean technique, refers to practices designed to reduce the number of pathogenic microorganisms and limit their growth and transmission in the patient's environment.

Mode of transmission



CONTACT



AIRBORNE TRANSMISSION



FEACO-ORALTRANSMISSION



BLOOD/BODY FLUIDS TRANSMISSION

Definition

In its broadest definition, an antibacterial is an agent that interferes with the growth and reproduction of bacteria. While antibiotics and antibacterials both attack bacteria, these terms have evolved over the years to mean two different things.

Antibacterial are now most commonly described as agents used to disinfect surfaces and eliminate potentially harmful bacteria.

Common Antibacterials

Antibacterials may be divided into two groups according to their speed of action and residue production:

The first group contains those that act rapidly to destroy bacteria, but quickly disappear (by evaporation or break-down) and leave no active residue behind (referred to as non-residue-producing). Examples of this type are the alcohols, chlorine, peroxides, and aldehydes.

The second group consists mostly of newer compounds that leave long-acting residues on the surface to be disinfected and thus have a prolonged action (referred to as residue-producing). Common examples of this group are triclosan, triclocarban, and benzalkonium chloride

List of antibacterial agents

Substance Group	Substance
Alcohols	ethanol isopropanol
Aldehydes	glutaraldehyde formaldehyde
halogen-releasing compounds	chlorine compounds iodine compounds
Peroxides	hydrogen peroxide ozone peracetic acid
gaseous substances	ethylene oxide formaldehyde

Residue-producing antibacterials

Substance Group	Substance
Anilides Biguanides	triclocarban chlorhexidine alexidine polymeric biguanides
Bisphenols	triclosan hexachlorophene
Halophenols heavy metals mercury compounds	PCMX (p-chloro-m-xenol) silver compounds
phenols and cresols	phenol cresol
quaternary ammonium compounds	cetrimide benzalkonium chloride cetylpyridinium chloride

Quality:

Quality is defined as the extent of resemblance between the purpose of health care and the truly granted care.

Safety:

Safety is the condition of being protected from or unlikely to cause danger, risk, or injury.

JCI Recommendations:

JCI:



- A division of the joint commission
- Mission is to improve the quality of health care
- Accreditation is a voluntary process in which an agency assess a health care organization to improve quality of care
- Provides a visible commitment towards improving quality of patient care ensuring a safe environment and reducing risk to staff

Access to care & continuity of care:

- 5 focus areas:
 - Admission into the organization
 - Continuity of care
 - Discharge, referral, follow up

- Transfer of patients
- Transportation
- Reduction of barriers to care (Language, cultural, religious, physical)
- Discharge & transfer process
- Continuity of care
- Safety during transportation
- Informing patients regarding proposed care, expected outcomes and expected costs
- On pass policy
- Color coding in triage:
 - **Red: Most urgent**
 - **Yellow: Urgent**
 - **Green: Non urgent**
 - **Black: Dead**

Triage category	Priority	Color	Conditions
Immediate	1	RED	Chest wounds, shock, open fractures, 2-3 burns
Delayed	2	YELLOW	Stable abdominal wound, eye and CNS injuries
Minimal	3	GREEN	Minor burns, minor fractures, minor bleeding
Expectant	4	BLACK	Unresponsive, high spinal cord injury

- Discharge planning form:
 - D/C planning is done at the time of admission so that a patient's needs even after discharge can be planned well ahead in time
 - This improves quality of patient care and decreases readmissions due to lack of availability of vital equipment at home, after discharge

