

MEDICO-LEGAL AND TOXICOLOGY MODULE

PHASE II

**Student Hand Book
2021**



**Faculty of Medicine
University of Kelaniya**

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“Those who have dissected or inspected many bodies have at least learned to doubt, while those who are ignorant of anatomy and do not take the trouble to attend to it, are in no doubt at all”

***Giovanni Morgagni
Father of Morbid Anatomy***

MESSAGE FROM THE MODULE COMMITTEE

Dear Student,

The Medico-legal and Toxicology module is conducted during 4th year of the MBBS medical course. It will be the only opportunity for you to learn about the medico-legal responsibilities of doctors, if you do not go on to specialize in Forensic Medicine.

This module is designed for you to gain the required basic knowledge and skills in Forensic Medicine to function as a medico legal expert. Further it includes progress indicators which will enable you to assess yourself during and at the end of the module. The mode of delivery will be a blended method which include practical sessions at the North Colombo Teaching Hospital, online sessions and face to face sessions.

It is advisable for you to follow the instructions carefully and achieve your learning outcomes at the end of the module. If you encounter any difficulties, you are welcome to seek help from the members of the academic staff attached to the department of Forensic Medicine.

Best Wishes,

Prof. Indira Kitulwatte
Chairperson, Medico-Legal and Toxicology Module

Medico-Legal Module Committee

Prof. Indira Kitulwatte - Department of Forensic Medicine
(Chairperson)

Dr. P. Paranitharan -Department of Forensic Medicine
(Co - Chairperson)

Prof. P.A.S. Edirisinghe - Department of Forensic Medicine

Dr. Nirmala Perera -Department of Forensic Medicine

Dr. Kithsiri Gunawardane- Department of Parasitology

Dr. Shaluka Jayamanna- Department of Medicine

Dr. S.A.F. Kurukulasooriya - Department of Pharmacology

Extended Faculty

Mr. Madhawa Tennakoon – Senior State Counsel, Department of Attorney General, Sri Lanka

Dr. Asela Mendis – Head, Department of Forensic Medicine & Toxicology, Faculty of medicine, University of Colombo

Dr. Handun Wijewardena – Consultant JMO, Colombo North Teaching Hospital

Dr. Lushan Hettiarachchi – Consultant Forensic Psychiatrist – National Institute of Mental Health, Angoda

Dr. Jayanee Weerathna – Forensic Odontologist, Institute of Legal Medicine & Toxicology, Colombo

AIM

To enable students to gather adequate knowledge and skills to attend to their Medico-Legal duties efficiently when they practice as doctors

OBJECTIVES OF THE MEDICO- LEGAL AND TOXICOLOGY MODULE

At the end of the module, you should be able to;

- (1) Describe different medico-legal duties required of a doctor working in the following roles:-
 - A Medical Officer in the out-patient department of a hospital.
 - A House Officer in charge of a ward in a hospital.
 - Specialist in any field or a Director of a hospital.
 - A District Medical Officer or Medical Officer (Medico-legal)
 - A General Practitioner
 - A Doctor working in any other capacity.
- (2) Outline the medico-legal frame work and the relevant sections of the Penal Code, Criminal Procedure Code and Transplantation of Human Tissue Act of Sri Lanka.
- (3) Identify, record, form an opinion and report on different types of injuries and describe their medico-legal significance.
- (4) Describe the different injury patterns and circumstances under which they occur.
- (5) Explain the concept of death, make the diagnosis of death, issue the Certificate of Cause of Death and describe the procedure involved in disposal of death and exhumation.
- (6) Describe the changes, which take place in a body after death and their medico-legal significance.
- (7) Perform postmortem examinations, record observations, formulate causes of death, carry out further investigations and draw conclusions.
- (8) Examine victims and suspects in cases of assault, accidents, sexual offences, abortion, child abuse, wife battery/gender based violence, elder abuse, torture, drug & alcohol abuse and any such person that the Court directs.

- (9) Fill relevant medico-legal reports and give oral evidence in the court of law as an expert witness.
- (10) Explain the methods in establishing the identity of the deceased or the living.
- (11) Visit and examine a scene of crime with a team, collect evidence and formulate conclusions.
- (12) Describe the medico-legal investigations of sudden, unexplained, unexpected, obscure and suspicious deaths.
- (13) Describe the medico-legal investigations of deaths due to accidents, suicides, homicides, civil and criminal negligence.
- (14) Describe medico legal importance of mental disorders.
- (15) Develop an unbiased attitude towards society especially with regard to victims and suspects.
- (16) Cultivate attitudes necessary to function as a member of a team in investigation of crime.
- (17) Identify the types, circumstances, principles of management of common poisons in Sri Lanka.

Intended Learning outcomes of the module in relation to the faculty outcomes

Faculty Outcomes		Broad content areas are included under following
Doctor as a practitioner	Clinical skills and patient management	History, examination, investigation (laboratory, radiological and other) and medico-legal management of each patient produced by police with an MLEF or magistrate order and other ward referrals.
	Communication skills	Competence as an expert for the criminal justice system (investigator and an expert witness) PBL, SGD and case discussion seminars
	Population health & health systems	Cause of death based on WHO proforma.
	Information management	Writing medico-legal reports and managing the documents for the criminal justice system, Practical sessions involving virtual laboratories
Doctor as a scientist	Scientific basis of Medicine	Normal structure and function of each anatomical areas, mechanisms of causation of injuries, Medico-legal implications of different types of injuries, expert evidence in the court of law, Pathogenesis of diseases, their aetiology, pathology, investigations and contribution in arriving at a cause of death. Toxicological analysis of different types of poisons and medico-legal aspects.
	Critical thinking and research	Medico-legal opinion formations as an expert Tutorials, PBL, case discussion seminars, quiz
Doctor as a professional	Professional values, attitudes & ethics	Role of the medical officer in assisting administration of justice with regards to documentation and reporting medico legal cases. Develop unbiased attitudes on patient/ examinee and Team work with other professionals Be an expert witness in a court of law

LEARNING RESOURCES

I. Lectures

You will be given an opportunity to listen to lectures on the most important aspects in Forensic Medicine and Toxicology. The PowerPoint presentations used for selected lectures (including relevant photographs) will be available. **Due to prevailing pandemic situation, the lectures will be delivered online. Recorded power point presentations of each topic will be uploaded and there will be live zoom sessions in addition to the uploaded lectures, summarizing the key areas.**

II. Handouts

Handouts on the lecture topics will be **available in CAL. In addition, the recorded lectures, and recorded live zoom discussions also will be available.**

III. Video Demonstrations

- The procedure of performing a postmortem examination will be demonstrated with a documentary film during the lectures/clinical appointment.
- The procedure of performing an exhumation will be demonstrated with another documentary film during the lectures/clinical appointment
- The procedure on performing evidence collection in alleged sexually assaulted victim
- Video demonstration on museum specimens

IV. Tutorials

The tutorials will be arranged on selected important topics and will be conducted online. You are expected to attend all tutorials. The attendance will be marked. The satisfactory attendance of tutorials is a prerequisite to sit the final module exam.

V. Post mortem Demonstrations and Ward Classes

During the clinical appointment you will be able to observe and also to assist in a case of postmortem and examination of patients with medico-legal problems under the guidance of the academic staff.

VI. Fixed Learning Materials

Museum specimens of soft tissues, bones and photographs of various medico-legal cases with descriptions are available (in digital form and hard copies) at the department of Forensic Medicine and the Computer Assisted Learning (CAL) platform. In addition, a set of selected specimens and photographs will be displayed in the museum with questions pertaining to medico legal issues.

VII. Computer Assisted Learning (CAL) platform

All the e-learning materials (lecture notes, recorded lectures, video –demonstrations, recorded interactive discussions, recorded PBLs, recorded SGD, model questions, recorded question discussions and other study materials) are available in CAL for reference. These materials can be accessed from Legal Medicine and Toxicology module and the Forensic Medicine Clerkship platforms.

VIII. QUIZ

There are quizzes uploaded to CAL covering main subject areas to ensure self-directed learning. These quizzes will enable the student to have a self-assessment of their learning.

IX. Self study

Self-study is strongly recommended with museum specimens, medico-legal reports and medico-legal text books available in the Forensic Medicine library and the Main library.

Uploaded learning materials related to content areas of forensic medicine are available in CAL.

COURSE CONTENTS

The course contents are listed below together with a key that guides you in differentiating between the required core knowledge and skills and areas that are “nice to know”

***KEY TO BETTER UNDERSTANDING OF THE COURSE CONTENTS.**

- (A) Comprehensive knowledge of specified area and competency in specified medico- legal work
- (B) Knowledge of the basic principles with ability to identify where referral is needed
- (C) Nice to know

Core Knowledge = (A) + (B)

(1) Introduction to Forensic Medicine

- (a) Definition and Scope of Forensic Medicine - **B**
- (b) Aims and Objectives of the Module - **B**
- (c) What we expect from the students - **B**

(2) Mechanical Trauma

- (a) Types of injuries, definitions, features and causations - **A**
- (b) Interpretation of injuries in respect of; - **A**
 - i. Causative weapon
 - ii. Circumstances of causation
(accidental/suicidal/homicidal/self-inflicted/fabricated/defense etc.)
 - iii. Dating of injuries
 - iv. Antemortem and postmortem injuries

(3) Regional Injuries

Medico-legal significance, sequelae & complications in relation to following regions of the body - **A**

- (a) Head/face
- (b) Neck
- (c) Chest
- (d) Abdomen
- (e) Pelvis/genitals
- (f) Limbs

(4) Medico-legal documents & category of hurt in relation to Penal Code Sec.311

- (a) MLEF - **A**
- (b) MLR - **A**
- (c) Giving oral evidence as expert witness - **A**
- (d) Dying declaration, Testamentary capacity - **B**

(5) Road-Traffic Accidents

Injury pattern, method of causation and prevention of injuries in;

- (a) Pedestrian - **A**
- (b) Driver, front seat passenger, occupant - **A**
- (c) Motorcyclist/ Pillion Rider/ Pedal cyclist - **A**
- (d) Investigation in a case of 'Hit and Run' - **A**
- (e) Investigation of body found on or by the rail tract. (Accidental, suicidal, homicidal or postmortem disposal) - **B**

(6) Firearm Injuries

- (a) Types of firearms (smooth bore and rifled), mechanisms of their operation and causation of injuries - **A**
- (b) Identify entry/exit wounds - **A**
- (c) Estimate range/ direction/angle of discharge - **B**
- (d) Circumstances – homicide/suicide/accident – **B**

(7) Blast Injuries

- (a) What causes blast injuries - **A**
- (b) Components of the blast and the injuries caused by those components - **A**
- (c) Interpretation of injuries caused by a blast - **A**
- (d) Investigation/Visit to a scene of mass disaster following a bomb explosion - **A**
- (e) Problems encountered at the autopsy of victim of a mass disaster following a bomb explosion - **A**

(8) Injury from Physical Agents

- (a) Heat & cold (general) - **B**
Hyperthermia and Hypothermia
Both clinical and postmortem findings
- (b) Burns - **A**
- Flame burns,
- Moist burns,
- Corrosive burns
(Identification of burns from their features)
Medico-Legal Investigation of a charred body found in a burnt down house
Heat artifacts
- (c) Electrocution injuries - **A**
Appearance of an injury
Mechanism of death
Post mortem findings
- (d) Lightning - **A**
Mechanism of causation of injury
Post mortem findings
Mechanism of death
Investigation in a case of death due to lightning

(9) Physical and Sexual Child Abuse

- (a) Types of child abuse - **A**
- (b) Diagnosis of child abuse - **A**
- (c) Classical clinical features / autopsy findings in case of child abuse - **A**
- (d) Differential diagnosis of child abuse - **A**
- (e) Case conference – **B**

(10) Battering & Torture

- (a) Circumstances of battery & torture - **B**
- (b) Methods used - **A**
- (c) Diagnosis of battery & torture – **A**

(11) Sexual Offences

- (a) Laws on Rape/Incest/Unnatural offences/Grave sexual offence - **A**
- (b) Clinical examination of a victim of rape, ethical aspect & the collection of samples - **A**
- (c) Interpretation of injuries found on a victim of rape - **A**
- (d) Clinical examination & collection of samples of an assailant - **A**
- (e) Examination of victim & assailant in a case of anal intercourse - **A**
- (f) Examination, interpretation of injuries & reporting in a case of child sexual abuse – **A**

(12). Abortion

- (a) Definition (Medical and Legal) - **A**
- (b) Laws related to abortion in Sri Lanka - **A**
(Sec. 303 of the Penal Code)
- (c) Method used - **A**
- (d) Complication & the Cause of Death - **A**
- (e) Diagnosis of criminal abortion – clinical & at autopsy - **A**

(13). Infanticide

- (a) Laws related to infanticide in Sri Lanka - **A**
- (b) Diagnosis of live birth and still birth - **A**
- (c) Estimation of the maturity - **B**
- (d) Act of commission or omission - **A**
- (e) Autopsy in a case of suspected neonatal death - **B**
- (f) Examination of the mother - **B**

(14) Death

- (a) Definition of death (Somatic death /molecular death / brain death) - **B**
- (b) Diagnosis of death - **A**
- (c) Certification of death, writing declaration of death form - **A**
- (d) Disposal of death - **B**

(15) Inquirer into Sudden Deaths and Inquest Procedure

- (a) Definition and relevant sections of Criminal Procedure Code - **B**
- (b) Types of death that need an inquest - **A**
- (c) Inquest procedure - **A**
- (d) Duties of inquirer into sudden death - **A**
- (e) Doctor's role in an inquest - **A**

- (16) **Pathological Autopsy**
(a) Requirements for pathological autopsy – **A**
- (17) **Medico-legal autopsy**
(a) Aims & objectives of medico-legal autopsy - **A**
(b) Procedure to be followed in medico-legal autopsy – **A**
- (18) **Transplantation of Human Tissue Act**
(a) Basic concepts related to the above act – **A**
- (19) **Scene of Crime**
(a) What is a scene of crime - **A**
(b) Who, Why, When, to visit - **A**
(c) Record and collect evidence at a scene - **A**
(d) Dispatch of a body from the scene to the mortuary - **A**
- (20) **Exhumation**
(a) Legal requirement - **A**
(b) How to carry out an exhumation - **B**
- (21) **Postmortem changes in a body**
(a) Early changes - **A**
(b) Late changes - **A**
(c) Remote changes- Adipocere, Mummification & Skeletonisation - **A**
- (22) **Estimation of time since death**
(a) Medical methods - **A**
 - Postmortem changes
 - Cessation of physiological functions
(b) Non-medical methods (circumstantial) - **A**
(c) Limitations of available methods - **A**
- (23) **Identification of living & dead**
(a) External features - **A**
(b) Clothing and Personal belongings - **A**
(c) Dentition - **A**
(d) Finger prints - **A**
(e) Introduction to Forensic Anthropology - **B**
(f) Special Techniques e.g. Video Superimposition, Facial Reconstruction etc. - **B**
(g) DNA profiling – **B**
- (24) **Sudden adult death**
(a) Definition - **A**
(b) Causes of sudden death - **A**
(c) Postmortem findings of sudden death - **A**
(d) Concept of obscure & negative autopsy - **B**
- (25) **Sudden Infant death**
(a) Definition - **A**
(b) Postmortem examination of Sudden Infant Death Syndrome – **B**
- (26) **Starvation & Neglect**

- (a) Causes & circumstances - **B**
- (b) Postmortem findings – **A**

(27) Asphyxia

- (a) Definition - **A**
- (b) Features, Pathophysiology of various types of asphyxia - **A**
- (c) Different modes of asphyxia - **A**
- (d) Mechanisms of death - **A**
- (e) Postmortem findings - **A**
- (f) Investigation of Asphyxial deaths – **A**

(28) Alcohol

- (a) Stages of intoxication - **A**
- (b) Clinical examination for drunkenness - **A**
- (c) Other methods available to establish drunkenness - **A**
- (d) Effects of alcohol on the ability to drive - **A**
- (e) Laws related to drunkenness - **A**
- (f) Differential diagnosis of alcohol intoxication - **A**
- (g) Sudden death due to alcohol abuse - **B**

(29) Collection of Trace Evidence

- (a) Sample collection-types & methods used - **A**
- (b) Examination of blood stains & other stains - **C**

(30) Deaths due to surgery & anesthesia

- (a) Definition - **B**
- (b) How to conduct an autopsy - **A**
- (c) Special investigations - **B**

(31) Duties of Medical Officers in the following roles;

- (a) A Medical Officer in the out-patient department - **A**
- (b) A House Officer in charge of a ward in a hospital - **A**
- (c) A Specialist in any field or a director of a hospital - **B**
- (d) A District Medical Officer or Medical Officer (Medico-legal) - **A**
- (e) A General Practitioner - **A**
- (f) A Doctor working in any other capacity - **A**

(32) Introduction to Forensic Psychiatry - **B**

(33) Basics of criminal law, criminal responsibility, culpable homicide/murder – **B**

(34) Introduction to Forensic Odontology - **B**

(35) Forensic Toxicology

- (a) Agrochemicals (OP, Paraquat & others) - **A**
- (b) Metals and non metals - **A**
- (c) Corrosives - **A**
- (d) Irrespirable agents - **B**
- (e) Plant poisons - **A**

- (f) Therapeutic drugs - **A**
- (g) Envenomation by animals - **A**
- (h) Principles of management in cases of poisoning - **A**

OBJECTIVES OF THE CLINICAL APPOINTMENT

At the end of 50 hours of Clinical Appointment in Forensic Medicine you should be able to:

1. Examine patients for medico-legal purposes
2. Identify types of injuries
3. Describe injuries for medico-legal purposes
4. Categorize injuries (category of hurt)
5. Complete Medico Legal examination Form & Medico Legal Report
6. Perform a routine postmortem examination
7. Identify the postmortem changes
8. Describe the postmortem findings in a routine postmortem examination
9. Writing a Post Mortem Report in Health 42
10. Formulate Cause of Death according to WHO classification
11. Identify, describe & formulate conclusions on, plant, soft tissue and bone specimens

ASSESSMENT OF MEDICO-LEGAL MODULE

Knowledge on Forensic Medicine and Toxicology will be assessed in

1. Continuous Assessment 8
2. Unit 4 of the 2nd examination for Medical degree

CONTINUOUS ASSESSMENT

CA 8 Consists of

- Structured Essay Questions
- Practical component

CA8 contribute with 10% of the Unit 4 examination marks.

The practical component will be based on the Evaluation of a Medico-legal Examination of a living person during the Forensic Medicine Clinical attachment in the course of 4th year.


UNIT 4 EXAMINATION

Unit 4 examination consists of

- Structured Essay Questions
- Multiple Choice Questions
- OSPE

SELF ASSESSMENT

At the end of the module and clinical appointment, the student should be able to assess him/herself. If he/she finds him/herself at a lower ranking the person should take appropriate remedial measures to correct the short comings.



My overall level of knowledge, skills & application in Forensic medicine is improved during the module & clinical appointment

S. Agree 3 marks	Agree 2 marks	Disagree 0 marks

SUGGESTED READING MATERIALS

- Simpson's Forensic Medicine; Eds: Jason Pane-James, Richard Jones, Steven Karch, John Manlove 14th Edition, 2019
- Margaret M Stark: Clinical Forensic Medicine, A physician's Guide 3rd Edition, Human Press, 2011
- Pekka Saukko & Bernard Knight: Knight's Forensic Pathology, 4th Edition, 2015

- Vincent JM DiMaio and Zuzanna E Dana: Hand book of Forensic Pathology; 2nd Edition
- Jason Payne-James and Roger W. Byard Encyclopedia of Forensic and Legal medicine Reference Work, 2nd Edition, 2016
- Prof. Ravindra Fernando: Management of Poisoning; 4th revised edition
- L B L De Alwis: Lecture Notes in Forensic Medicine; volume I,II, III,IV

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