MEDICO-LEGAL AND TOXICOLOGY MODULE

PHASE II

Student Hand Book

2017

Faculty of Medicine
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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 Medical 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.

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,

Dr. P.Paranitharan
Chairperson, Medico-Legal and Toxicology Module

Medico-Legal Module Committee

- Dr. P.Paranitharan-Department of Forensic Medicine
  (Chairperson)
- Dr. Indira Kitulwatte-Department of Forensic Medicine
  (Co - Chairperson)
- Dr. Nirmala Perera -Department of Forensic Medicine
- Prof. PAS. Edirisinghe -Department of Forensic Medicine
- Prof. Kithsiri Gunawardane- Department of Parasitology
- Dr. Shaluka Jayamanna- Department of Medicine
- Dr. N. V. Luke- Department of Pharmacology
- Dr. Asiri Rodrigo - Department of Psychiatry
**Extended Faculty**

- Professor Ravindra Fernando - Senior Professor of Forensic Medicine & Toxicology, Faculty of Medicine, Colombo
- Dr. L.B.L. de Alwis – Chief Judicial Medical Officer (retired), Institute of Forensic Medicine and Toxicology, Colombo
- Mr. Palitha Fernando – Attorney General of Sri Lanka (retired)
- Dr. P.R. Ruwanpura – Consultant JMO, Teaching Hospital, Karapitiya
- Dr. Handun Wijewardena - Consultant JMO, Colombo North teaching Hospital
- Dr. Angelo de Alwis – Consultant Psychiatrist, Forensic Psychiatry Unit, National Institute of Mental Health Sri Lanka
- Dr. Jayani Weeraratne – 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:-
   - Medical Officer in the out-patient department of a hospital.
   - House Officer in charge of a ward in a hospital.
   - Specialist in any field or Director of a hospital.
   - District Medical Officer or Medical Officer (Medico-legal)
   - General Practitioner
   - 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 of 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.

These objectives will be covered in the Medico-legal Module and during the medico-legal rotation in the fourth year.
### Intended Learning outcomes of the module in relation to the faculty outcomes

<table>
<thead>
<tr>
<th>Faculty Outcomes</th>
<th>Broad content areas are included under following</th>
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<td><strong>Doctor as a practitioner</strong></td>
<td><strong>Clinical skills and patient management</strong></td>
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</table>
| | - History taking physical examination and medico-legal management of clients produced by police with an MLEF or magistrate order and other ward referrals.  
  - Perform post-mortem examinations  
  - Request laboratory and radiological investigation as appropriate. |
| | **Communication skills** |
| | - Verbal communication with victims, perpetrators, law enforcement authorities, healthcare workers, media and the public in dealing with medico-legal issues  
  - Written communication with law-enforcement authorities healthcare officials and public in dealing with medico-legal issues |
| | **Population health & health systems** |
| | - Working with the existing health system in dealing with medico-legal issues |
| | **Information management** |
| | - Retrieving information from relevant sources for evidence-based practice in relation to medico-legal duties  
  - Accurate documentation and record-keeping |
| **Doctor as a scientist** | **Scientific basis of Medicine** |
| | - Normal structure and function of each anatomical area,  
  - 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 & research** |
| | - Following protocols / guidelines and comply with evidence in medico-legal practices |
| **Doctor as a professional** | **Professional values, attitudes & ethics** |
| | - Possessing attributes like honesty, integrity and truthfulness in performing medico-legal duties  
  - Maintaining confidentiality and privacy in medico-legal examination  
  - Identifying own limitations and seek for help in medico-legal tasks where appropriate |
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 Power Point presentations used for selected lectures (including relevant photographs) will be available.

II. Handouts
Handouts on the lecture topics will be available in the relevant section of the Virtual Learning Environment together with additional learning material.

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

IV. Tutorials
The tutorials will be arranged on selected important topics. 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.

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 faculty Forensic Medicine web site. In addition a set of selected specimens and photographs will be displayed in the museum with questions pertaining to medico legal issues or the virtual lab would be utilized to demonstrate the same set of forensic materials.

VII. E- Learning Material
Selected e-learning materials are available in the newly established ‘Virtual Learning Environment’ which can be accessed from the department of Forensic Medicine web site.

VIII. QUIZ
A friendly competition among different groups of medical students to promote active learning will be held during module hours.

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.
Fixed learning materials based on photographs of medico-legal relevance in question and answer format is available in the Forensic Medicine Museum.

**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. Ante-mortem 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 cycler-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, culpablehomicide/murder—B**

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

(34) **Forensic Toxicology**
(a) Agrochemicals (OP, Paraquat & others)-A
(b) Metals and non metals-A
(c) Corrosives-A
(d) Irrespectable agents-B
(e) Plant poisons-A
(f) Therapeutic drugs-A
(g) Envenomation by animals-A
(h) Principles of management in cases of poisoning-A
ASSESSMENTS

Knowledge on Forensic Medicine and Toxicology will be assessed in
1. Continuous Assessment 8
2. Unit 4 of the 2\textsuperscript{nd} examination for Medical degree

CONTINUOUS ASSESSMENT

CA 8 Consists of
\begin{itemize}
  \item Structured Essay Questions
  \item Practical component
\end{itemize}

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 4\textsuperscript{th} year.

UNIT 4 EXAMINATION

Unit 4 examination consists of
\begin{itemize}
  \item Structured Essay Questions
  \item Multiple Choice Questions/ Single best response
  \item OSPE
\end{itemize}
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.

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<tr>
<th>S. Agree</th>
<th>Agree</th>
<th>Disagree</th>
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<tr>
<td>3 marks</td>
<td>2 marks</td>
<td>0 marks</td>
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My overall level of knowledge, skills & application in Forensic medicine is improved during the module & clinical appointment

SUGGESTED READING MATERIALS

- Simpson’s Forensic Medicine; Eds: Jason Pane-James, Richard Jones, Steven Karch, John Manlove 13th Edition
- Margaret M Stark: Clinical Forensic Medicine, A physician’s Guide 2nd Edition
- Pekka Saukko & Bernard Knight: Knight’s Forensic Pathology, 3rd Edition
- Pathology of trauma by JK Mason & BN Purdue 3rd Edition 1999
- Forensic Medicine Clinical and Pathological Aspects. Jason Pane-James, Anthony Busuttil, William Smock 2002
- Prof. Ravindra Fernando: Management of Poisoning; 4th revised edition
- L B L De Alwis: Lecture Notes in Forensic Medicine; volume I, II, III, IV