



# CMSA

The Colleges of Medicine of South Africa NPC

Nonprofit Company (Reg No.1955/000003/08)  
Nonprofit Organisation (Reg. No. 009-874 NPO)  
Vat No. 4210273191

27 Rhodes Avenue, PARKTOWN WEST, 2193

Tel: +27 11 726 7037; Fax: +27 11 726 4036

Website:

[www.cmsa.co.za](http://www.cmsa.co.za)

General:

[Academic.Registrar@cmsa.co.za](mailto:Academic.Registrar@cmsa.co.za)

**JOHANNESBURG OFFICE**  
**EXAMINATIONS & CREDENTIALS**

**February 2022**

## REGULATIONS

### FOR ADMISSION TO THE DIPLOMA IN FORENSIC MEDICINE

### OF THE COLLEGE OF FORENSIC PATHOLOGISTS OF SOUTH AFRICA

## Dip For Med(SA) Clin Path

### **1.0 ADMISSION TO THE EXAMINATION**

(to be read in conjunction with the Instructions)

The candidate must have

- 1.1 been a qualified medical practitioner for a period of not less than 6 months
- 1.2 completed the periods of training detailed in 2. This will require certification by the heads (or deputies) of the departments concerned

The CMSA Senate, through its Examinations and Credentials Committee, will review all applications for admission to the examination and may also review the professional and ethical standing of candidates

### **2.0 TRAINING FOR THE EXAMINATION**

- 2.1 The candidate writing the Diploma in Forensic Medicine – Clinical Pathology must have adequate practical exposure to both the clinical aspects (drunken-driving examinations, rape examinations, etc) and the morbid or pathological aspects (the performance of autopsies) of forensic medicine
- 2.2 The attached Logbook Requirements (*see Annexure A*) specifies the minimum training requirements
- 2.3 Candidates not employed as Registrars or Medical Officers in HPCSA accredited training posts at HPCSA accredited University Departments of Forensic Medicine, will be required to spend a minimum of 14 days (not necessarily consecutively) in an HPCSA accredited University Department of Forensic Medicine, and/or a CMSA approved community health centre, and/or other Clinical Forensic Medical Departments (see 2.4.1), where their skills can be evaluated and they can be subjected to performing post-mortems and participating in clinical forensic medical examinations under supervision and be taught the specialised techniques required of them, as specified in the Logbook Requirements
- 2.4 Candidates not employed in clinical forensic medical officer posts, as well as Forensic Pathology Registrars or Medical Officers not exposed to Clinical Forensic Medical examinations:
  - 2.4.1 will be required to attend and assist with clinical forensic examinations of sexual assault victims, child abuse victims and drunken drivers, as specified in the logbook requirements, at CMSA approved community health centres and/or other clinical forensic medical departments specialising in family violence, child abuse or rape cases
  - 2.4.2 will be required to attend court cases pertaining to the above clinical medico-legal examinations, as specified in the logbook requirements

- 2.5 As an alternative to the requirements in 2.3 and 2.4 above, the prospective candidate for the purpose of the Dip For Med(SA) – Clin Path:
- 2.5.1 may choose to attend the 14-day course in forensic medicine offered by the University of Natal held in Mthatha, should this course be reinstated
  - 2.5.2 should another university offer a similar course due consideration will be given by the Examinations and Credentials Committee for course recognition
  - 2.5.3 candidates working in academic forensic medical departments internationally, must furnish the CMSA with full details of their qualifications and their forensic departments of employ and include a record of their forensic medical training, experience and activities, verified and signed by their academic heads of departments. Due consideration will be given by the Examinations and Credentials Committee for recognition of their qualifications and training and admission to the examination
- 2.6 Evidence in the form of the attached completed portfolio, verified and signed by the relevant forensic heads of department and/or supervising training practitioners, will be required, to demonstrate that the candidate has fulfilled the requirements in the various fields of forensic medicine, as specified in the logbook requirements
- 2.7 Candidates who are currently or have recently been employed in clinical forensic medical officer posts and forensic medicine registrars, will be required to provide proof of such employment including:
- 2.7.1 type and rank of appointment, geographical service area and time period of this employment
  - 2.7.2 a brief description of types and numbers of clinical forensic cases, medico-legal autopsies and court cases dealt with during this period, using the logbook requirements as a guideline
  - 2.7.3 due consideration will be given by the Examinations and Credentials Committee for recognition of their practical in-service training and experience, for admission to the examination

### **3.0 EDUCATIONAL AIM/PURPOSE/GOAL OF THIS DIPLOMA**

- 3.1 To enhance postgraduate forensic medical education and to raise the standard of forensic medicine. General practitioners of forensic medicine such as forensic medical officers and casualty officers, especially those in areas remote from training centres, will be given the opportunity of improving their qualifications. In addition, the aim is to develop a network of practitioners interested in forensic medicine and to promote the discipline of forensic medicine
- 3.2 Competence of generalists practising forensic medicine is increased by means of certified training in an HPCSA accredited academic department of forensic medicine and/or CMSA approved Community Health Centres and/or other Clinical Forensic Medical Departments specialising in Family Violence, Child Abuse or Rape cases and this competence is then measured and assessed via a practical, oral and written examination
- 3.3 By undergoing a period of training in an academic department of forensic medicine and having competence assessed and proved by a written, practical and oral examination, the standards of medico-legal autopsies performed and clinical forensic medical community services rendered, are enhanced

### **3.4 THE HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA DOES NOT RECOGNISE THE DIPLOMA IN FORENSIC MEDICINE(SA) AS A SPECIALIST QUALIFICATION.**

### **4.0 SYLLABUS OF THE EXAMINATION**

#### **See Appendix B for Detailed Learning Objectives**

- 4.1 The law specifically affecting the practise of medicine in South Africa
- 4.2 Medico-legal examinations of forensic importance including the taking of relevant specimens, knowledge of the principles of the various tests and the interpretation of the results obtained in eg cases of assault, sexual offences, recent pregnancy, acute alcoholic intoxication and other relevant forensic examinations as specified in Annexures A and B
- 4.3 An extensive and thorough technical knowledge of the performance of the tests is not expected; but an appreciation of the techniques, sufficient to enable proper and adequate collection, packing and dispatch of specimens is required
- 4.4 Principles of the medico-legal aspects of identification

- 4.5 The signs of death and the changes occurring after death
- 4.6 The general technique of autopsy and an appreciation of morbid anatomy, including special autopsy techniques
- 4.7 The taking of relevant specimens and the interpretation of the results obtained and understanding the importance and maintenance of “chains of custody”
- 4.8 The autopsy of:
  - i) sudden “unexpected / unexplained” death due to natural causes
  - ii) death owing to accident, suicide or homicide
  - iii) death associated with anaesthesia and procedure-related deaths

## **5.0 CONDUCT OF THE EXAMINATION**

The examination will consist of three parts:

- 5.1 two online written papers, each of three hours and based on the following sections:
  - clinical forensic medicine and the law in relation to the practise of medicine in South Africa
  - forensic pathology including aspects of toxicology
- 5.2 a decentralised practical examination (Assessment of Competence – AoC) at a designated mortuary venue which will include a full or partial medico-legal post-mortem examination and may include a docket or crime kit analysis
- 5.3 A Structured Oral Examination (SOE) at the designated mortuary venue (see 5.2 above) immediately following successful completion of the practical examination
- 5.4 **WEIGHTING OF THE EXAMINATION**
  - Written Paper 1 – 25%
  - Written Paper 2 – 25%
  - Practical Examination (Assessment of Competence) – 25%
  - Structured Oral Examination – 25%

Candidates must obtain a minimum pass mark of 50% in each of the two written papers in addition to a 50% pass mark in the practical examination as well as 50% pass mark in the oral examination

- 5.5 The following was agreed at the CMSA Senate meeting of 30 October 2019: THAT if a candidate passes the written component of a Diploma examination but fails the oral/clinical/OSCE/OSPE/practical component, they will be permitted to redo the oral/clinical/OSCE/OSPE/practical component only at the next set of examinations without having to rewrite the written component. This carry over of the written component results will only be permitted once, and only for the oral/clinical/OSCE/OSPE/practical examination directly following the failed examination.<sup>1</sup>

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<sup>1</sup> Effective SS2019

**6.0 READING RECOMMENDATIONS**

- Knight B. Simpson's Forensic Medicine. Ed 11<sup>th</sup> ed. Edward Arnold, 1996
- Di Maio VJM, Di Maio DJ. Forensic Pathology. Boca Raton: CRC Press, 2001
- Olshaker JS, Jackson MC, Smock WS. Forensic Emergency Medicine. Philadelphia: Lippincott Williams & Wilkins, 2001
- Ludwig J. Handbook of Autopsy Practice. 3<sup>rd</sup> ed. Humana Press
- Schwär TG, Loubser JD, Olivier JA, The Forensic ABC in Medical Practice – A Practical Guide. Pretoria: Haum Publishers, 1988  
(out of print – borrow or purchase used copy)
- McLay WDS (Ed). Clinical Forensic Medicine. 2<sup>nd</sup> ed. London: Greenwich Medical Media, 1996
- Dada MA. (Ed) Introduction to Medico-legal Practice. Butterworths, 2001
- McQuoid-Mason DJ, Dada MA. Guide to Forensic Medicine and Medical Law. Independent Medico-legal Unit, University of Natal, 1999
- Crimes against Women and Children, A Medico-legal Guide. Published by the Independent Medico-legal Unit, University of Natal
- Forensic Criminalistics. Published by Butterworths and used by UNISA (certain sections only)
- MAJOR REFERENCE TEXTBOOKS ONLY:
  - Knight B. Forensic Pathology. 3<sup>rd</sup> ed. New York,: Oxford University Press, 2003
  - Mason JK, Purdue BN. The Pathology of Trauma. 3<sup>rd</sup> ed. New York: Oxford University Press, Arnold, 2000
  - Mason JK. Paediatric Forensic Medicine and Pathology., Chapman and Hall, 1989
  - Busuttill A, Payne-James J, Smock W. Forensic Medicine: Clinical and Pathological Aspects. Greenwich Medical Media, 2003

**7.0 ADMISSION AS A DIPLOMATE**

7.1 The candidate having passed the examination and having been admitted as a Diplomate in Forensic Medicine (Clin-Path) of the College of Forensic Pathologists of South Africa, will be asked to sign a declaration, as under:

I, the undersigned, ..... do solemnly and sincerely declare

that while a member of the CMSA I will at all times do all within my power to promote the objects of the CMSA and uphold the dignity of the CMSA and its members

that I will observe the provisions of the Memorandum and Articles of Association, By-laws, Regulations and Code of Ethics of the CMSA as in force from time to time

that I will obey every lawful summons issued by order of the Senate of the said CMSA, having no reasonable excuse to the contrary

and I make this solemn declaration faithfully promising to adhere to its terms

Signed at ..... this ..... day of

..... 20 .....

Signature .....

Witness .....

(who must be a Founder, Associate Founder, Fellow, Member, Diplomate or Commissioner of Oaths)

7.2 A two-thirds majority of members of the CMSA Senate present at the relevant meeting shall be necessary for the award to any candidate of a Diploma

7.3 A Diplomate shall be entitled to the appropriate form of certificate under the seal of the CMSA

7.4 In the event of a candidate not being awarded the Diploma (after having passed the examination) the examination fee shall be refunded in full

7.5 The first annual subscription is due one year after registration (statements are rendered annually)

# APPENDIX A

## DIP FOR MED(SA) CLIN PATH LOGBOOK REQUIREMENTS:

| <b>1. AUTOPSIES:</b><br>(Complete, full autopsies)  | <b>OBSERVED</b><br><b>(20)</b>    | <b>PERFORMED</b><br><b>(6)</b>               |
|---|-----------------------------------|--|
| • Gunshot wounds  | 5                                 | 2  |
| • Decomposed remains  | 1                                 | 0  |
| • Skeleton  | 1(If possible)                    | 0  |
| • Stab wounds   | 2                                 | 1  |
| • Anaesthetic associated deaths   | 2                                 | 0  |
| • Rape/sexual homicide (Technique can be taught on other victims)   | 1                                 | 0  |
| • Hanging or strangulation  | 1                                 | 1  |
| • Drugs or poisoning  | 1                                 | 0  |
| • Motor vehicle accidents   | 2                                 | 1  |
| • Assault with head injuries  | 2                                 | 1  |
| • Natural or sudden unexplained deaths  | 1                                 | 0  |
| • Stillborn or liveborn with gestational ageing   | 1                                 | 0  |
| <b>2. SPECIAL TECHNIQUES:</b><br>(Can be taught and practised on all cases)                                   | <b>OBSERVED</b><br><b>(17)</b>    | <b>PERFORMED</b><br><b>(21)</b>              |
| • Bloodless neck  | 2                                 | 2  |
| • Pneumothorax test   | 1                                 | 2  |
| • Venous air embolism test  | 1                                 | 2  |
| • Subclavian vessels diss   | 1                                 | 2  |
| • Alcohol specimen collection   | 5                                 | 5  |
| • Toxi specimen collection  | 1                                 | 2  |
| • Rape examination and specimen collection  | 2                                 | 2  |
| • Histo specimen collection   | 2                                 | 2  |
| • Opening of spine  | 1                                 | 1  |
| • Hydrostatic test in babies  | 1                                 | 1  |
| <b>3. CLINICAL FORENSIC EXAMINATIONS:</b><br>(Difficult with LIVE victims – must have consent of patient etc) | <b>OBSERVED</b><br><b>(15/16)</b> | <b>PERFORMED/<br/>EXAMINED</b><br><b>(0)</b> |
| • Rape and sexual assault<br>Cases (3 or 4 Adult & 1 or 2 Children)   | 5<br>(In Total)                   | 0 but must assist with 1                     |
| • Drunk driver examinations   | 5                                 | 0 but must assist with 1                     |
| • Child or elder abuse cases (may include sexual abuse)   | 2                                 | 0 but must assist with 1                     |
| • Ageing of people  | 1(If possible)                    | 0  |
| • Mental certification  | 1(If possible)                    | 0  |
| <b>4. COURT WORK:</b>   | <b>OBSERVED</b><br><b>(8)</b>     | <b>TESTIFIED</b><br><b>(0)</b>               |
| • Testifying in court<br>(2 clinical & 2 pathology)   | 4                                 | 0  |
| • Dockets:<br>- Negligence reports  | 4                                 | 0  |

## APPENDIX B

### DIP FOR MED(SA) CLIN PATH – LEARNING OBJECTIVES FORENSIC MEDICINE - CLINICAL & PATHOLOGY:

CANDIDATES MUST KNOW AND UNDERSTAND THE FOLLOWING:

#### 1.0 LAWS AND ETHICS

##### 1.1 THE SOUTH AFRICAN LEGAL SYSTEM

- How South African law is made
- Criminal and civil law
- Structure of the courts
- **Aspects of laws and bills relevant to health professionals:**
  - The Medical, Dental and Supplementary Health Service Professions Act 56 of 1974, as amended (The Health Professions Act)
  - The Inquests Act 58 of 1959, as amended
  - The Births and Death Registration Act 51 of 1992
  - The repealed Human Tissues Act 65 of 1983, as amended and incorporated in Chapter 8 of the new National Health Act 32 of 2003 as “Control of use of Blood, Blood Products, Tissues and Gametes in Humans”
  - The Correction Services Act 111 of 1998
  - The Occupational Diseases in Mines and Works Act 78 of 1973
  - The Health Act 63 of 1977, as amended (Reporting of notifiable diseases)
  - The Child Care Act 74 of 1983, as amended (Reporting of child abuse)
  - The Domestic Violence Act 116 of 1998
  - The Prevention of Family Violence Act 133 of 1993
  - The Sexual Offences Act 23 of 1957, as amended
  - The Termination or Choice of Pregnancy Act 92 of 1996
  - The Sterilisation Act 44 of 1998
  - The National Road Traffic Act 93 of 1996
  - The Criminal Procedure Act 51 of 1977
  - The Medicines and Related Substances Control Act 101 of 1965, as amended in the Medicines and Related Substances Control Amendment Act 90 of 1997
  - The Mental Health Act 18 of 1973, as amended (Reporting of dangerous patients)
  - The Occupational Health and Safety Act 85 of 1993
  - The Compensation for Occupational Injuries and Diseases Act 130 of 1993
  - The Mine Health and Safety Act 29 of 1996

LAWS  
GOVERNING  
THE  
PERFORMANCE  
OF  
AUTOPSIES

Websites: [www.polity.org.za](http://www.polity.org.za) and [www.healthlink.org.za](http://www.healthlink.org.za). Copies of above LAWS available through the CMSA

##### 1.2 MEDICAL RECORDS

- Contents of and reasons for keeping medical records
- Sources of information for medical records
- Access to medical records
- Standardised protocols for keeping accurate records
- Problems of improper records

##### 1.3 INQUESTS:

- What is an Inquest?
- Laws governing Inquests
- Procedures, findings and consequences of Inquests
- How Inquests affect medical practitioners

**1.4 MEDICAL EVIDENCE:**

- Role of medical evidence in court and court room etiquette
- Expert vs opinion evidence and the role of the expert medical witness
- Preservation of “chain of evidence/custody”

**1.5 MEDICAL LAW AND ETHICS:**

- Principles of medical ethics
- Differences between ethical and legal obligations
- Human rights protection by medical personnel
- Patient’s rights and responsibilities
- Ethical and legal problems with scarce resources
- The doctor-patient relationship and contract
- Informed consent:
  - definition and validity
  - by spouses, minors, mentally ill
  - emergency treatment without consent
- Doctor-patient confidentiality
- Medical malpractice or negligence – the “reasonable doctor”

**2.0 FORENSIC MEDICINE****2.1 SEXUAL OFFENCES:**

- Statutory provisions
- Types and definitions of sexual offences: define rape and other sexual offences under South African law
- Procedures governing the medical examination of a rape / sexual assault survivor and the follow-up care needed in such patients
- Protocols for the overall management of rape / sexual assault survivors, ie adults and children, including:
  - consent for examination
  - timing and place of examination
  - immediate and long term care of complainant:
    - medical, pregnancy, STD’s, psychological, social
  - details of alleged rape/sexual assault and medical and sexual history
  - nature of examination – general, anogenital
  - normal anatomy, physiology and development of genitalia, breasts, anus and rectum
  - documentation and photography of findings (J 88) including:
    - history, descriptions and line diagrams
  - forensic evidence:
    - methods of sampling, handling and preservation of samples, forensic analysis and persistence of evidence
    - seminal fluid, saliva (in bite wounds), blood or skin (under finger nails), foreign hairs and fibres
    - on and in victim’s clothing, skin, hair, nails, oral cavity, genitalia, anus and other body areas
  - basic principles of forensic analysis:
    - collection of forensic samples
    - packaging and chain of custody
    - analysis: microscopy, serology, DNA
  - medical evidence:
    - injuries and lesions
    - genitalia, anus, oral, other
    - examination methods and documentation of injuries
    - blood and urine analysis
  - STD screening, samples for comparative DNA analysis
- Patterns of rape in SA
- Examination of suspect/alleged assailant in sexual assault, including procedure and forensic samples
  - Describe and ... /



- Describe and perform the medico-legal autopsy in cases of suspected sexual (assault/rape) homicides including:
  - anticipation and recognition of fatalities where rape/sexual assault may have taken place
  - handling of the body from scene to mortuary: preservation of evidence
  - approach to medico-legal autopsy in these cases including:
    - details of alleged rape/sexual assault and medical and sexual history (where possible)
    - nature of examination – general, anogenital
    - normal anatomy, physiology and development of genitalia, breasts, anus and rectum
    - documentation and photography of findings including history, descriptions and line diagrams
    - *forensic evidence:*
      - ❖ methods of sampling, handling and preservation of samples, forensic analysis and persistence of evidence
      - ❖ seminal fluid, saliva (in bite wounds), blood or skin (under finger nails), foreign hairs and fibres
      - ❖ at scene and on and in victim's clothing, skin, hair, nails, oral cavity, genitalia, anus and other body areas
      - ❖ victim's blood samples for comparative DNA analysis
    - *basic principles of forensic analysis:*
      - ❖ collection of forensic samples
      - ❖ packaging and chain of custody
      - ❖ microscopy, serology, DNA, chemistry
    - *medical evidence:*
      - ❖ injuries and lesions
      - ❖ genitalia, anus, oral, other body areas
      - ❖ examination methods and documentation of injuries
      - ❖ blood and urine analysis

## 2.2 ABUSE OF THE ELDERLY AND SPOUSE ABUSE:

- AMA (American Medical Association) definitions: physical, psychological and/or material abuse/neglect and violation of personal rights

## 2.3 NON-ACCIDENTAL INJURY IN CHILDREN:

- Definition, classification, risk factors and effects of child abuse
- Statutory provisions for the protection of children from abuse
- Role and legal obligations of medical practitioner
  - (Child Care Act 74 of 1983, section 42)
- Types of abuse: physical, sexual, emotional/psychological and neglect
- Assessing and examining the abused child and pointers to the diagnosis:
  - recognition and overall handling of forensic evidence
  - X-rays, photographs, wound descriptions and documentation
  - STD screening, samples for comparative DNA analysis
- The battered child or non-accidental injury syndrome
- Munchausen syndrome by proxy
- Types and patterns of injuries:
  - soft tissue injuries including bite marks
  - thermal injuries
  - skeletal injuries
  - internal injuries
- Sexual abuse of children (see “Sexual Offences” above)

- The medico-legal autopsy in fatal cases of child abuse or suspicious child deaths including:
  - anticipation and recognition of fatalities where child abuse with or without sexual assault may have taken place
  - handling of the body from scene to mortuary: preservation of evidence
  - approach to medico-legal autopsy in these cases including:
    - recognition and overall handling of forensic evidence
    - X-rays, photographs, wound descriptions and documentation
    - complete autopsy including collection of evidence (eg foreign pubic hair in suspected sexual assault), victim's blood samples for comparative DNA analysis and special investigations (for histological ageing of wounds or toxicological investigations)

## 2.4 ALCOHOL:

- Physico-chemical properties of alcohol
- Absorption, distribution, metabolism and elimination of alcohol
- Effects of alcohol and differential diagnosis of intoxication
- Degrees of intoxication
- Blood-alcohol concentration graphs
- Death from alcohol poisoning
- Alcohol dependence and withdrawal
- Chronic effects of alcohol abuse
- Calculations regarding alcohol including the Widmark formula
- Alcohol and driving:
  - laws relating to alcohol and driving
  - breath testing
  - effects of alcohol on performance
    - patients NOT arrested but suspected to be under the influence of alcohol taking of specimens without consent or arrest – medical practitioner's role (Criminal Procedure Act 51 of 1977, section 37(2)(b))
  - authorisation to examine persons arrested for driving under the influence of alcohol (DUI) (SAP 308(a))
  - examination of persons arrested for DUI including conditions mimicking alcohol intoxication
  - the medical practitioner's responsibility:
    - taking of samples: containers, preservatives, collection techniques, packaging and chain of custody
    - documentation of findings and investigations (GW 7/54)
  - analytical laboratory techniques for examining specimens
  - drugs and driving including: opiates, sedative-hypnotics, anti-depressants, OTC and prescription drugs, cannabis, cocaine, methamphetamines, amphetamines, khat, ketamine, gamma-hydroxy butyrate, phencyclidine and lysergic acid diethylamide (LSD)
- The medico-legal autopsy and collection of samples for alcohol analysis, including:
  - cases in which samples should be collected
  - deaths due to alcohol poisoning
  - sites and techniques of post-mortem blood sample collection
  - samples other than blood (vitreous humour, CSF, urine)
  - handling, preservation and documentation of samples
  - taking of samples: containers, preservatives, packaging and chain of custody
  - interpretation of post-mortem alcohol laboratory results, including factors influencing the alcohol concentration in post-mortem blood samples:
    - effects of post-mortem interval and decomposition
    - effects of burning/incineration
    - effects of site(s) and types of sample collection
    - effects of sample container preservatives and storage
- documentation of findings and investigations

**2.5 DRUGS OF DEPENDANCE AND ABUSE:**

- Commonly used drugs including prescription-, OTC- (over-the-counter) and “recreational” drugs viz :
  - opiates, sedative-hypnotics, anti-depressants, cannabis, cocaine, methamphetamines, amphetamines, khat, ketamine, gamma-hydroxy butyrate, phencyclidine and lysergic acid diethylamide (LSD) and volatile solvents
- Routes of drug administration including “body packers”, “stuffers” and/or “swallowers”
- Physical risks and complications of intravenous- and subcutaneous injections including acute and chronic infections, micro-emboli, granulomas and abscesses
- Psychiatric, psychological and physiological complications including: dependence, tolerance and withdrawal
- The “lethal dose” definition
- Manners of drug-related deaths viz accidental, suicidal and homicidal
- Mechanisms of drug-related deaths viz cardiac arrhythmias, CNS- and respiratory depression
- Clinical investigations and specimens
- The medico-legal autopsy in drug-related deaths including special investigations viz:
  - cases in which samples should be collected
  - sites and techniques of post-mortem blood sample collection
  - samples other than blood (stomach contents, liver, kidneys, urine vitreous humour, hair)
  - drug “paraphernalia” found at scene or accompanying body
  - tissue samples for histological examination eg in intravenous drug abusers and cocaine or methamphetamine abusers
  - handling of samples: containers, preservatives, packaging and chain of custody

**2.6 FORENSIC TOXICOLOGY AND POISONING:**

- Definition and classification of poisons
- Factors influencing toxicity
  - administration, dose, biochemical and genetic factors
  - methods of poisoning (accidental, homicidal, suicidal and environmental)
- Effects and symptoms of common poisons including:
  - insecticides (DDT, organophosphates, carbamates [aldicarb/ “Temik”])
  - herbicides (paraquat)
  - rodenticides (thallium, phosphorus)
  - hydrocarbons (paraffin, benzene)
  - caustic substances (acids, alkalis)
  - heavy metals (mercury, arsenic, lead, thallium, iron)
  - gases (carbon monoxide, cyanide)
  - bacteria (ecoli, clostridia, staphylococcus, shigella, salmonella)
  - plants (alkaloids, glycosides, polypeptides, amines, oxalates, resins, phytotoxins )
  - magic mushrooms (psilocybin), Mexican cactus (mescaline)
- The role of the medical practitioner in cases of suspected deliberate ‘criminal’ poisoning
- Notifiable poisonings
  - agricultural or stock remedy
  - occupational
- Collection and storage of samples for toxicological analysis in clinical cases
  - blood, urine, vomitus and stomach contents, faeces, hair and nail clippings and miscellaneous substances found with the patient
  - documentation, containers, preservatives, packaging and chain of custody
- Poisoning and the medico-legal autopsy:
  - situations when autopsy toxicology should be performed
  - autopsy specimens: liver, kidneys, blood, urine, vitreous humour stomach and contents, bowel, hair and nail clippings and miscellaneous substances found with the deceased
  - documentation, containers, preservatives, packaging and chain of custody
  - problems with post mortem toxicology

**2.7 TORTURE, TREATMENT OF DETAINEES AND DEATHS IN CUSTODY:**

- definition of torture and methods of torture
- rights of prisoners and detainees
- role of health care professionals in torture and treating prisoners and detainees
- diagnosis, treatment and prevention of torture
- principles for the treatment of prisoners and detainees by medical practitioners
- definition of custody-related deaths
- recommendations to prevent custody-related deaths
- approach to the medico-legal investigation and autopsy in a custody-related death

**2.8 MEDICO-LEGAL ASPECTS OF MENTAL DISEASE AS CONTEMPLATED IN THE MENTAL HEALTH ACT 18 OF 1973:**

- definitions of “mental illness” and “patient”
- types of patients:
  - the voluntary submission, the voluntary outpatient, magistrate “reception orders” and practitioners’ roles, persons/patients dangerous to themselves or others and practitioners’ responsibilities, urgent admissions, State President’s patients, the mentally ill prisoner
- permission for medical treatment of mentally ill patients
- mental institutions
- the patient’s “curator ad litem”
- the use of mechanical bodily restraints

**2.9 IDENTIFICATION AND AGEING OF THE LIVING AND THE DEAD:**

- approach to identification and ageing of a person
- external examination of the body including:
  - clothing, jewellery, wallets etc.
  - morphological characteristics (age, sex, race, stature), tattoos and fingerprints
- internal examination of the body:
  - unusual traits/operations/abnormalities, pacemakers etc
- special investigations:
  - X-ray comparisons: body (radiological bone architecture), teeth, frontal sinuses
  - DNA fingerprinting (blood, muscle, spleen, bone marrow, tooth pulp, etc)
  - photo-superimposition
- broad understanding of the specialties of forensic odontology, anthropology, radiology, serology:
  - forensic odontology:
    - identification of charred remains, fragmentation of bodies, decomposed - or skeletal remains: comparative dental X-rays and casts
    - bite mark evidence (child abuse and sexual offences): casts and salivary DNA
    - race, age, gender determination
  - forensic radiology:
    - age determination - ossification centers and epiphyseal fusion
    - identification - comparative X-rays of bones (sinus)/teeth with medical records
  - forensic anthropology:- decomposed or skeletal remains:
    - are they bones?
    - human bones, how many sets?
    - age, sex, race, stature?
    - personal identity:
      - ❖ clothing, jewellery, wallets etc
      - ❖ medical & dental records of injury/disease affecting bone/teeth
      - ❖ comparative sinus and other X-rays
      - ❖ facial reconstruction of skulls and photo-super-imposition
      - ❖ comparative DNA
    - how long dead/buried?
    - cause of death (forensic pathologist)?

- Forensic serology ... /

- forensic serology:
  - blood groups and their individuality and inheritance – broad overview
  - comparative DNA profiling – broad overview of analytical techniques (PCR, STR's & VNTR's)
  - used in:
    - ❖ identification in general eg in mass disasters
    - ❖ paternity/maternity (parentage) determination
    - ❖ maternity determination in concealment of birth
    - ❖ blood stain/tissue comparisons in assaults/homicides, eg rapes and sexual offences and 'muti' murders
    - ❖ missing persons
  - samples:
    - ❖ blood, tissues, buccal smears, tooth pulp, femoral heads, hair roots, vaginal/anal/oral swabs, dried semen/blood stains
    - ❖ preservation and transport of samples

### 3.0 TRAUMATOLOGY

#### 3.1 DESCRIBING AND DOCUMENTING OF INJURIES:

- nature of injury (bruises, abrasions, lacerations and incisions)
- size, shape, position and broad age category (recent or healing)
- transient lesions (eg imprint of hand on recently slapped buttocks of child)
- photography (with metric scale alongside), body charts and anatomic line diagrams

#### 3.2 TYPES AND COMPLICATIONS OF INJURY:

- definition, mechanism of causation and typical characteristics of:
  - bruises, abrasions, lacerations and incisions
- differentiation between sharp- and blunt force injuries and gunshot wounds
- complications of injury including: haemorrhage, embolism (thrombo, air, fat, foreign material embolism), infection, sepsis, DIC, ARDS, renal failure, pneumonia, haemo-pneumothorax, as well as:
  - distinguishing between broncho and lobar pneumonia with respect to causes and autopsy appearances
  - distinguishing between ante-mortem thrombo-emboli and post-mortem blood clots
- survival periods following ultimately fatal injuries

#### 3.3 REGIONAL INJURIES:

##### 3.3.1 HEAD INJURIES including:

- mechanisms of head injury:
  - contact (sharp/blunt force and open/penetrating/closed)
  - non-contact (acceleration/deceleration/rotation and brain lag)
- classification of head injuries:
  - scalp / skull
  - extracerebral membrane haemorrhages : extradural/subdural/subarachnoid
  - brain injuries:
    - focal (lacerations, contusions, haematomas and coup vs contrecoup)
    - diffuse (petechiae, diffuse axonal injury, hypoxic/ischaemic, swelling)
  - complications/secondary events:
    - cerebral oedema, raised IC pressure, brain herniations, hydrocephalus, infarction, infections and abscesses
    - neurogenic pulmonary oedema, DIC
- good understanding of:
  - sharp force and penetrating injuries of skull and brain with emphasis on trans-orbital stab wounds and penetrating/perforating gunshot wounds of the head

|   |
|---|
| Stresses/Strains/<br>Forces<br>- Compressive<br>- Tensile<br>- Shearing |
|---|

- blunt force ... /

- blunt force injury: the stationary vs mobile head and primary consequences of blunt force injury:
  - stationary/immobile head → contusions, lacerations, intra-cerebral haemorrhages, as well as extradural haemorrhage with fracture through groove of middle meningeal artery
  - moving/mobile head → acceleration/deceleration injuries: coup and contre-coup injuries, rotational injuries, gliding contusions, subdural and subarachnoid haemorrhages
- complications of head injuries including cerebral oedema, brain herniation, rocephalus, infections and abscesses
- mechanisms of cerebral oedema: hydrostatic, vasogenic, interstitial and cytotoxic
- raised intracranial pressure and cerebral herniations:
  - Parahippocampal gyrus herniation (uni- or bilateral)
  - Central downwards herniation with pontine and midbrain haemorrhages
  - Inferior cerebellar herniation (tonsillar herniation)
  - Superior cerebellar herniation
  - Burr-hole and mushroom herniation
- correlation of clinical findings with neuropathology after trauma eg C III (oculomotor) compression due to raised ICP and transtentorial herniation → dilated ipsilateral pupil
- differentiation between reversible and irreversible head injuries as diagnosed in patients in trauma units

### 3.3.2 SPINAL INJURIES

### 3.3.3 CHEST INJURIES

### 3.3.4 PELVI-ABDOMINAL INJURIES

### 3.3.5 NECK INJURIES

### 3.3.6 LIMB INJURIES

## 3.4 FIREARM AND EXPLOSION INJURIES:

- types of firearms including smooth-bore and rifled weapons
- broad understanding of external, internal, and terminal (wound) ballistics, including effects of types of weapons, types of ammunition and projectile flight characteristics
- wounding potential of bullets – muzzle velocities and kinetic energy transfer, as well as tissue characteristics and temporary cavitation
- mechanisms of injury: direct projectile effects, secondary missile effects, compression waves and temporary cavitation
- effects of intermediary objects and ricochet on projectiles and gunshot wounds
- medico-legal examination of wounds from smooth-bore and rifled weapons including:
  - entrance and exit wounds: typical appearances in general
  - entrance wound appearances and range estimates (contact, close, intermediate and distant range)
  - accidental, suicidal or homicidal – typical characteristics?
  - the doctor's duty in firearm injuries and deaths including:
    - recognition, description, documentation and photography of wounds
    - forensic evidence: collection, handling and preservation of evidence in the living including: clothing, hair, skin samples, projectiles/bullets
    - handling of body of deceased victim in the hospital setting
    - reporting of cases in the living victims
    - documentation and maintaining chain of evidence
- injuries caused by explosions including: blast effects, primary and secondary effects of explosive devices
- rubber and plastic bullets – wounding potential
- the medico-legal autopsy in gunshot wound fatalities including:
  - handling of the body and clothing of the deceased prior to autopsy eg X-rays and photography
  - recognition, description, documentation and photography of wounds
  - forensic evidence: collection, handling and preservation of evidence in the deceased including: clothing, hair, skin samples, projectiles/bullets
  - documentation and maintaining chain of evidence

**3.5 TRANSPORTATION INJURIES:**

- road traffic injuries including pedestrians, car occupants, function of seatbelts
- motor cycle and bicycle injuries
- doctor's duty in clinical and medico-legal autopsy examination in road traffic accident victims including:
  - taking of blood alcohol samples (see Criminal Procedure Act, section 37(2)(b)) (see section on ALCOHOL 2.4)
  - description and documentation of wounds
  - evidence collection, handling and preservation in the living and the deceased including: foreign material eg paint flakes or glass in wounds, clothing or hair
- Railway injuries
- Aircraft and mass disaster survivors – general clinical medico-legal approach
- Aircraft accident fatalities - general medico-legal autopsy approach - referral to specialist forensic pathologist
- mass disaster fatalities - general medico-legal autopsy approach – collaboration with other specialists

**3.6 ASPHYXIAL DEATHS**

- definition and categories of asphyxia/anoxia (anoxic, anaemic, stagnant and histotoxic anoxia)
- classical 'signs of asphyxia' ("obsolete diagnostic quintet")
- 'asphyxial conditions' including: suffocation, smothering, choking, aspiration, bolus death, traumatic asphyxia, throttling, strangulation, hanging, drowning
- pathophysiology or mechanisms of death in the 'asphyxias' including: airway obstruction, vascular obstruction, neurogenic or reflex cardiac arrest (and "toxic" anaemic or histotoxic hypoxia in carbon monoxide or cyanide poisoning – see next section)
- medico-legal autopsy examination including:
  - external examination:
    - documentation of body appearance and injuries, photographs, X-rays, collection and handling of evidence (eg ligatures)
  - internal examination:
    - complete autopsy including bloodless or strip dissection of the neck
  - special investigations
    - blood alcohol, toxicology, histology, trace and other evidence

**3.7 GASEOUS POISONS AND IRRITANTS:**

- carbon monoxide (CO) poisoning:
  - sources and pathophysiology of CO
  - the medico-legal autopsy including:
    - carboxyhaemoglobin levels and autopsy findings in fatal CO poisoning
    - autopsy specimen collection
- cyanide and cyanogen gas poisoning (histotoxic hypoxia)
  - sources and pathophysiology of cyanide
  - the medico-legal autopsy including:
    - autopsy findings in fatal cyanide poisoning
    - autopsy specimen collection
- crowd control agents and their risk effects:
  - pepper spray (OC – oleum capsicum)
  - mace (CN - chloracetophenone)
  - tear gas (CS – chlorobenzylidene malononitrile)

**3.8 IMMERSION AND DROWNING:**

- classification and definitions of deaths associated with immersion in a fluid medium: (dry-, wet-, near-, secondary-, and pseudo drowning)
- signs of immersion and protective physiologic mechanisms in the submerged victim
- mechanisms of death associated with drowning
- differences in fresh vs salt water drowning
- the medico-legal autopsy and special investigations in deaths associated with immersion in a fluid medium

### 3.9 DEATH AND INJURY DUE TO BURNS, HYPO AND HYPERTHERMIA, ELECTRICITY AND LIGHTNING

- **BURNS**
  - definition ('wet' heat scald, 'dry' heat burn) and degrees of severity
  - estimation of body surface area of burning – 'rule of nine'
  - purpose of and medico-legal autopsy examination of bodies recovered from fire:
    - identity of victim
    - alive or dead at time of fire?
    - pre-existing pathology: natural and/or unnatural
  - burn artifacts eg extradural burn haematoma
  - complications of burns
- **HYPERTHERMIA:**
  - Definition, causes and predisposing factors
  - Physiology of temperature control (thermoregulation)
  - Benign hyperthermia / heatstroke (classic and exertional) and malignant hyperthermia of anaesthesia
  - Predisposing factors
  - Typical clinical and medico-legal autopsy findings and special investigations
- **HYPOTHERMIA:**
  - definition, causes and predisposing factors
  - typical clinical and medico-legal autopsy findings and special investigations
- **ELECTRICAL INJURY:**
  - variables in electric shock (variations in current and contact)
  - external evidence of electrical injury – the 'current mark'
  - typical clinical and medico-legal autopsy findings and special investigations
  - mechanisms of death in electrical injury
  - other causes of death associated with electrical injury
- **LIGHTNING:**
  - clothing and general appearances of victims
  - typical external injuries and skin lesions
  - typical medico-legal autopsy findings

### 3.10 PREGNANCY, ABORTION AND STERILISATION:

- symptoms and signs of pregnancy and clinical signs of past pregnancies
- methods of prevention of pregnancy (before and after sexual intercourse)
- mechanisms of sudden death during pregnancy including ectopic pregnancies
- mechanisms of maternal death during or following full term deliveries, including amniotic fluid embolism
- definitions of: abortion, viability, spontaneous abortion, legally induced abortion, criminal abortion
- methods of induced abortion (legal and criminal)
- early and late complications of abortion (legal and criminal)
- management of suspected case of criminal abortion
- mechanisms of death following abortion (legal and criminal)
- statutory provisions for legal termination of pregnancy in SA viz The Choice on Termination of Pregnancy Act 1996, including:
  - circumstances and conditions under which pregnancy may be terminated
  - place where surgical termination may take place
  - consent for TOP
  - notification and keeping of records
  - offences and penalties
- The Sterilisation Act 1998, including:
  - definition of sterilisation
  - consent for and place of sterilisation
  - requirements where person is incapable of consenting or incompetent to consent
- The medico-legal autopsy in cases of maternal death resulting from criminal abortion including special dissection techniques and special investigations



**3.11 DEATH AND INJURY IN THE PERI-NATAL PERIOD AND INFANCY:**

- definition of peri-natal deaths (in utero, still births and early neonatal)
- purpose of neonatal autopsies – to establish:
  - whether born alive or still-born
  - gestational age and viability of newborn
  - identification of neonate and mother: race, gender, clothing, DNA
  - cause of death – natural or unnatural
  - how long did newborn live?
  - how long has newborn been dead?
- causes of peri-natal deaths including birth trauma and infanticide
- Sudden Infant Death Syndrome:
  - definition, incidence and epidemiological risk factors
  - hypotheses of possible mechanisms of death
  - medico-legal management of case of suspected SIDS:
    - parental interview
    - examination of the scene of death
    - issuing of the death certificate – controversy
  - the purpose of a SIDS autopsy and medico-legal significance thereof
  - the medico-legal SIDS autopsy and special investigations
- the medico-legal autopsy and special investigations in suspected infanticide (see Non-Accidental Injury in Children)

**3.12 ANAESTHETIC ASSOCIATED AND PROCEDURE RELATED DEATHS:**

- definition of Anaesthetic Associated Deaths (AAD's)
- statutory provisions for performing medico-legal autopsies in cases of AAD: The Health Professions Act 56 of 1974 & The Inquests Act 58 of 1959
- procedures to be followed by medical practitioners following an AAD
- classification of AAD's including:
  - deaths during but not due to the anaesthetic
  - deaths directly due to the anaesthetic
- inquests into AAD's as contemplated in The Inquests Act 58 of 1959
  - findings of the Inquest Magistrate
  - determination of negligence (an act or omission) on part of medical personnel
  - decisions of Attorney General
- the medico-legal autopsy including special investigations (histology and toxicology)

**4.0 FORENSIC PATHOLOGY****4.1 THE CRIME SCENE:**

- proper general procedures at the scene
- role of the investigating officer at the scene
- role of medical practitioner or pathologist at the scene including collection and/or preservation of forensic evidence, documentation and photography of findings
- risks to investigators at the scene

**4.2 THE MEDICO-LEGAL AUTOPSY:**

- purpose of the medico-legal autopsy
- laws governing the performance of the medico-legal autopsy:
  - The Medical, Dental and Supplementary Health Service Professions Act 56 of 1974, as amended (The Health Professions Act)
  - The Inquests Act 58 of 1959, as amended
  - The Births and Death Registration Act 51 of 1992
  - The Health Act 63 of 1977, as amended
  - The repealed Human Tissues Act 65 of 1983, as amended and incorporated in Chapter 8 of the new National Health Act 32 of 2003 as “Control of use of Blood, Blood Products, Tissues and Gametes in Humans”
  - The Correctional Services Act 111 of 1998
  - The Occupational Diseases in Mines and Works Act 78 of 1973

- Natural and ... /

- natural and unnatural deaths
  - define unnatural deaths
- define and distinguish cause, manner and mechanism of death
- know common causes of unexpected and/or sudden deaths including:
  - cardio-vascular, intracranial, respiratory, gastro-intestinal, gynaecological and obstetric deaths
- medico-legal aspects of the death certificate
  - classification of deaths according to their cause into natural or unnatural

#### 4.3 DEATH AND CHANGES IN THE BODY AFTER DEATH:

- diagnosis and the early signs of death
- rigor mortis, hypostasis and cooling of the body after death
- estimation of 'time of death'/'post-mortem interval'
- post-mortem decomposition including:
  - putrefaction, adipocere, mummification, skeletalisation
- post-mortem changes in bodies immersed in water or buried
- post-mortem injuries

#### 4.4 STEPS IN THE PERFORMANCE OF THE MEDICO-LEGAL AUTOPSY:

- scene investigation (see above)
- preliminary procedures
- health and safety in the mortuary – universal precautions
- general approach to description, photography and documentation of findings
- autopsy dissection procedures including special dissection techniques
- determination and formulation of the cause of death
- collection and forwarding of post-mortem medico-legal specimens and other forensic evidence for special laboratory investigations including:
  - pathology specimens
  - toxicology and alcohol specimens
  - identification specimens
  - ballistic/firearm-related specimens
  - microbiology specimens
  - clothing, ligatures, glass fragments, paint chips etc
- chain of custody/evidence procedures and documents – general handling of forensic evidence
- compiling the autopsy report