

Diploma course in Forensic Medical Sciences

SYLLABUS

The course will cover the areas shown in the syllabus for the DipFMS which is specified below. Students will be expected to have a theoretical knowledge of the basic facts and principles of all forms of medico-legal enquiry and the reason for the form of that enquiry. Topics to be covered include:

SECTION A

PRINCIPLES OF MEDICINE AND THE MEDICO-LEGAL AUTOPSY

1. Human anatomy and physiology

Knowledge of the structure and workings of the human body sufficient to understand medical evidence:

- Medical terminology, medico-legal reports
- Nature of cells, tissues, organs
- Body structure – skeleton, tissue layers, body cavities
- Body systems – component parts and functions
- detailed structure and function of cardiovascular, respiratory, haemopoetic, nervous and gastro-intestinal systems

2. Medical aspects of death

Understanding the nature and definition of death:

- cellular and somatic death
- concept of brain death; persistent vegetative state
- transplantation procedures

3. Physical changes after death

What happens to the body physically after death and what use can be made of this:

- general principles, relevance in determining time of death, and factors affecting
- temperature drop
- lividity
- rigor mortis
- decomposition and variants

4. Natural disease as a cause of death

Natural disease relevant to forensic practice – causes of sudden death:

- ischaemic heart disease – atheroma, myocardial infarction; relevance in assault deaths
- cardiomyopathy and inherited cardiac conditions
- hypertension, aneurysms
- pulmonary thromboembolism and deep venous thrombosis
- pneumonia, asthma, asbestos related disease
- cerebrovascular disease, subarachnoid haemorrhage, meningitis

- gastro-intestinal haemorrhage, peritonitis, pancreatitis
- septicaemia, MRSA, Cl difficile

SECTION B

LEGAL PROCEDURES RELATING TO DEATHS AND THEIR INVESTIGATION

5. Legal aspects of death

Knowledge of the necessary legal procedures after someone's death:

- legal responsibilities of the medical practitioner
- death certificates and procedure
- cremation certificates and procedure
- referring deaths to the Procurator Fiscal or Coroner
- weaknesses in the system and proposed reforms
- Human Tissue Act / Human Tissue (Scotland) Act and tissue retention

6. Procurator Fiscal and sudden deaths

Role of the Procurator Fiscal in the investigation of deaths in Scotland

- position of the Procurator Fiscal in the Scottish legal system and comparison with rest of UK
- legal responsibility in the investigation of deaths
- deaths reportable to Procurator Fiscal and process of investigation; involvement of police
- post mortem examinations; additional investigations and enquiries
- subsequent decisions and disposal
- Fatal Accident Inquiries; criminal proceedings

7. HM Coroner and sudden deaths

Role of the Coroner in the investigation of deaths in England, Wales and Northern Ireland

- position of the Coroner in England, Wales and Northern Ireland, and comparison with Scotland
- legal responsibility in the investigation of deaths
- deaths reportable to the Coroner and process of investigation; involvement of police
- post mortem examinations; additional investigations and enquiries
- subsequent decisions and disposal
- Inquests; referral for criminal proceedings

SECTION C

INJURY INTERPRETATION

8. Injury classification and causes

The nature of injuries and how they are produced, described and interpreted:

- occurrence of injuries in clinical and post mortem practice; limits of interpretation
- concept of blunt and sharp force trauma
- abrasions, bruises, lacerations
- incised wounds, stab wounds

- internal damage, issues of survivability
- injury patterns – accident, suicide or homicide

9. Major trauma

Clinical and pathological aspects of major trauma:

- transportation accidents and injury patterns
- accidents at work
- injury scores; Glasgow Coma Scale
- resuscitation techniques, transfusion, ventilation

10. Firearms and firearm injuries

Knowledge of the common types of guns, how they work, and the injuries they produce:

- classification of weapons and ammunition, circumstances of use, legal controls
- principles of how firearms produce injuries
- air weapons
- shotguns
- rifled weapons – revolvers, pistols, rifles
- automatic weapons, military small arms
- post mortem examination in firearms cases and injury interpretation
- role of radiology; recovery of evidence
- work of firearms units, test firing, matching of weapons

11. Head injuries

Understanding the mechanisms of head injuries, their clinical effects and the pathological findings:

- circumstances of head injuries – road traffic accidents, falls, assaults
- clinical presentation and outcome – concussion, coma, long term disabilities
- rationale for treatment – raised intracranial pressure, cerebral oedema, surgical intervention
- external injuries and interpretation
- skull fractures – linear, comminuted, depressed
- intracranial bleeding – extradural, subdural, subarachnoid and intracerebral haemorrhage
- brain injury – focal and diffuse

SECTION D

OTHER MECHANISMS OF INJURY AND DEATH

12. Asphyxia

Nature of asphyxia and its causes:

- definition of asphyxia and physiological mechanisms involved
- signs of asphyxia – petechial haemorrhages, cyanosis, congestion
- specific causes and relevance in forensic practice
- crush asphyxia
- suffocation – accidental, suicidal, homicidal; relevance in infant deaths
- compression of the neck – manual and ligature strangulation; reflex cardiac arrest; time-scale
- hanging

13. Drowning

Circumstances of drowning and the findings at post mortem:

- issues of 'bodies in water' and circumstances of drowning – accident, suicide, homicide
- physiological mechanisms involved
- aim of post mortem examination and typical findings – immersion v drowning
- problem cases – decomposition, injuries
- additional investigations – identification procedures, diatom studies

14. Hypothermia

Nature of hypothermia and its causes:

- definition and physiological mechanisms
- common circumstances – role of exposure, alcohol, injuries, natural disease, mental illness
- post mortem findings and diagnostic difficulties
- suspicious presentations

15. Fires, burns and carbon monoxide poisoning

Understanding the physics and circumstances of fires, and how they cause death:

- fire triangle, classification of types of fire
- incidence and common circumstances; role of alcohol
- fire investigation – establishing seat of fire, nature of damage caused, use of accelerants
- cause of death in fires – smoke inhalation, burning, trauma
- aim of post mortem examination and typical findings; establishing cause of death
- toxicology investigations – carbon monoxide, cyanide, alcohol
- issues over 'bodies in fire' – identification, concealed homicide
- burns - causes, methods of classification and principles of treatment
- carbon monoxide poisoning – toxic effects and sources other than house fires

16. Explosions

Understanding the nature of explosions and explosive devices, and their effects:

- causes of explosions – mechanical, gaseous, chemical
- gas explosions – gases involved, required conditions, effects
- explosive devices – nature and variety, use, fragmentation v blast
- lethal effects – blast injury, injuries from fragments, crushing, fires
- investigation of explosions

17. Child deaths and abuse

Causes of unexpected death in children, natural and otherwise

- sudden unexpected death in infancy – natural, SIDS, accidental, homicidal
- the paediatric post mortem examination
- SIDS – typical features, possible causes
- asphyxial deaths – overlaying, imposed airways obstruction; post mortem evidence
- child abuse – physical, sexual, neglect, emotional; parental characteristics and behaviour
- physical abuse – typical injuries – external, fractures, internal
- 'shaken infant syndrome'
- neonaticide

18. Deaths in custody

Deaths occurring in police and prison custody and how they are investigated:

- definitions of custody, numbers of deaths and how categorised
- in police custody - alcohol/drug related, suicide, injury, natural, restraint
- others – RTA, shooting, other contact
- how investigated; role of IPCC in England and Wales
- prison deaths
- legal investigations – Fatal Accident Inquiry, Coroner’s Inquest, criminal prosecution

19. Alcohol abuse

Alcohol related deaths and their frequency in forensic practice

- scale of alcohol abuse, social issues, morbidity and mortality
- deaths from acute intoxication – interpretation of alcohol levels
- trauma while intoxicated – falls, road traffic, fires, drowning, homicide etc.
- deaths and illness from chronic alcohol abuse – liver disease, pneumonia, epilepsy

20. Drug related deaths

Deaths from opiates, stimulants and other abused substances

- post mortem examination in drug related deaths, typical findings, health and safety issues
- sample collection, further investigations, interpretation of toxicology results
- cause of death – general principles, specific effects of individual drugs, contributing factors
- causes of death other than intoxication

SECTION E

CLINICAL FORENSIC MEDICINE

21. Confidentiality of medical information, consent and negligence

Appreciation of the legal and ethical aspects of medical practice and how they are regulated

- confidentiality of medical information – principles, circumstances of disclosure, public interest
- consent to medical treatment – nature of consent, when required, who can give, competency
- medical negligence – definition and legal requirements, duty of care, legal process
- General Medical Council – composition, structure and functions; Good Medical Practice
- responsibility for registration, medical education, medical advice and fitness to practice
- medical defence organisations

22. Sexual offences

Nature of sexual offences and their medical and scientific investigation

- legal definition of rape and differences between jurisdictions in UK
- circumstances and typical characteristics of sexual assaults and the victims
- role of the forensic physician / specialist teams in examination of victims; consent issues
- clinical examination procedure; evidential samples taken; further roles
- drug facilitated offences
- conclusions from examination; prosecution of cases through courts
- other sexual offences

23. Examination of detained persons

Duties of the forensic physician in examining and caring for those in police custody

- clinical and legal responsibilities; consent and disclosure issues
- reasons for examination – assessing fitness for custody, fitness for interview
- examination of injuries, obtaining evidential samples
- drug dependent detainees – examining and prescribing
- forensic examinations – procedures, intimate searches
- preparation of reports, presentation of evidence

24. Forensic psychiatry

Forensic aspects of mental illness and the role of the forensic psychiatrist

- classification of mental disorders relevant to criminal legal system
- psychoses – schizophrenia, affective disorders
- neuroses – anxiety, phobias, post traumatic stress
- personality disorder – psychopathic behaviour
- organic disorders, learning disabilities, drug misuse
- compulsory treatment orders and regulations
- psychiatric assessment – fitness to plead, insanity, diminished responsibility; subsequent disposal

SECTION F

FORENSIC SCIENCE AND TOXICOLOGY

25. Forensic science in crime investigation

The contribution of forensic science in the investigation of crime:

- the development of forensic science and current expertise
- crime scene investigation and the role of the Crime Scene Manager
- Locard's principle, trace evidence recovery, interpretation of findings
- main divisions in scientific work – biology, chemistry, toxicology
- hairs and fibres, glass and paint analysis, marks and impressions, documents
- firearms, fire investigation, blood pattern analysis, DNA profiling

26. DNA technology

Understanding DNA technology and its contribution to the investigation of crime

- basis of DNA profiling and its historical development; DNA database
- cell structure – chromosomes, DNA sequences, genetic code
- polymerase chain reaction (PCR), short tandem repeats (STR), mitochondrial DNA
- samples analysed, methodology, analytical issues
- presentation of DNA evidence in court

27. Forensic toxicology

Role of the forensic toxicologist

- clinical and post mortem toxicology
- nature of drugs and poisons; medicines legislation – Poisons Act, Medicines Act
- overdose of prescribed medication; adverse drug reactions
- samples analysed and equipment used – blood, urine, hair, saliva
- problems in interpretation; presentation of evidence

28. Alcohol and alcohol related offences

Chemistry and physiological effects of alcohol and the basis of road traffic legislation

- chemistry of alcohol and nature of alcoholic drinks
- absorption, breakdown and excretion of alcohol in the body, and factors affecting:
 - measurement of alcohol levels – blood, urine, breath
 - road traffic offences

29. Drugs of abuse

Categories and effects of abused drugs and the legislation controlling them

- definition of an abused drug; abuse statistics
- drug legislation and penalties – Misuse of Drugs Act
- opiates – heroin, methadone; benzodiazepines
- stimulants – cocaine, amphetamines, ecstasy
- hallucinogens; volatile substances
- ‘new’ drugs
- drugs and driving; drugs in sport

SECTION G

OTHER FORENSIC SPECIALITIES

30. Forensic odontology

Role of dentistry in forensic work

- use in identification and in examination of bite marks
- identification – single body / mass fatalities; ante mortem and post mortem data; role of radiology
- systems of dental charting; age estimation; DNA analysis
- bite marks – recognition, recording, interpreting, comparison with suspect
- possible conclusions, presentation of evidence in court

31. Forensic archaeology, anthropology, botany and entomology

Other scientific specialities that may be involved in crime investigation

- forensic archaeology – location of buried bodies; techniques used, soil analysis
- forensic anthropology – examination of the skeleton – identification, disease, trauma
- forensic botany – examination of vegetation, pollen, stomach contents
- forensic entomology – flies, maggots

32. Forensic expertise in an international setting

Appreciating the contribution of forensic specialists in major disasters and war crimes investigations

- using forensic expertise in victim identification and documentation of injuries
- concept of war crimes, development of international law and forensic involvement
- specific applications of forensic archaeology, anthropology and pathology
- presentation of evidence; international courts

SECTION H

THE LAW AS IT RELATES TO FORENSIC PRACTICE

33. Legal systems of the United Kingdom

Understanding the sources and structures of the law of the UK, the differences between jurisdictions, the personnel involved, and the structure of the courts

- civil versus criminal; adversarial versus inquisitorial
- different legal systems in UK
- legal personnel – solicitors, magistrates, advocates/barristers, sheriffs, judges

34. Prosecution of crime in the rest of the United Kingdom(except Scotland)

How crime is investigated and prosecuted in England, Wales and Northern Ireland

- Crown Prosecution Service; relationship with the police
- criminal court structure in England and Wales – magistrate and crown courts
- Police and Criminal Evidence Act
- initial procedures, court appearance, time limits
- preparation of case for prosecution
- conduct of trial – opening speech, witness evidence

35. Prosecution of crime in Scotland

How crime in Scotland is investigated and prosecuted through the courts

- structure and responsibilities of the Crown Office and Procurator Fiscal Service; the Law Officers
- criminal court structure in Scotland – district, sheriff and high courts; jurisdiction and powers
- role of the Procurator Fiscal in a criminal investigation; relationship with the Police
- initial procedures, court appearance, committal, time limits
- decisions on trial – summary or solemn; level of court; indictment; citation of witnesses
- preparation of case for trial – reports, witness statements, precognition
- conduct of trial – type of witnesses, presentation of evidence, cross examination

36. Role of the defence in criminal prosecutions

The role of an accused person's defence team in a criminal prosecution

- rights of the accused person and access to legal assistance
- role of defence primarily to test the prosecution case and the evidence submitted
- defences of diminished responsibility, provocation, alibi, self-defence, incrimination, insanity
- disclosure of prosecution reports and statements
- commissioning of own investigations and experts; limitations of examinations

37. Expert witnesses and the presentation of scientific evidence

The role and responsibilities of the expert witness

- distinction from other witnesses; opinion evidence; who decides
- qualifications – registration; Frye and Daubert tests
- responsibilities – independent, unbiased, expertise, clarity, disclosure
- position in other countries