Reading Material for

MORTUARY ASSISTANT

(Paper-B)

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PREFACE

This is the part two in the book series regarding the optimization of the mortuary regarding medicolegal work.

This part shall mainly focus on the practical aspect of the mortuary. General Post Mortem operational procedures shall be highlighted along with detailed explanation of the special autopsy procedures and techniques as in case of fetal autopsy, autopsy on putrefied dead bodies, drowning as well as criminal abortion and strangulation deaths.

It shall also emphasize upon as to what to and how to collect, seal and dispatch the viscera for various purposes like histopathology and toxicological screening in case of any pathological death or poisoning respectively.

Besides it shall also be describing the samples to be taken for serology, DNA analysis and how to dispatch material for gunshot residue detection.

Finally there will be a detailed discussion regarding embalming techniques and the restorative art of mutilated bodies.

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1. Introduction

This manual includes the practical approach towards the Post Mortem Examination consistent with the standard operational procedures regarding autopsy along with the special techniques required in specific cases like autopsy in case of putrefied bodies and autopsy on a fetus.

Every cases of unnatural death, with proper investigation of the scene by competent authority with one or more medico-legal experts should decide an autopsy to be carried out.

All unnatural deaths should undergo autopsy, to find out cause of death; in particular

a) Frank case of homicides
b) Suicides or suspected cases of suicide
c) All cases of road accidents
d) Sudden unexplained and unexpected death
e) Dead during disasters for cause of death as well as proper positive identification
f) Dead as a result of Medical Negligence
g) Dead in police custody
h) Dead as a result of human right violence
i) Unidentified bodies
j) Human skeletal remains

The medico-legal experts should perform his/her duty with dignity and conscience, his decision making should be total independence and impartiality. He / she should operate without any undue influence from law enforcement agencies and prosecutors.

2. Scene investigation General principles:

Any dead body, obvious or suspected unnatural death should be first reported to the competent authorities (Police), who will decide further investigation to be carried out.

Forensic doctor should be informed by investigating officer and visit the scene of death in any cases of suspicious death without delay.

He should coordinate with the team involved in death investigation.

2.1. Examination of the body:

2.2. Role of the police:

Police should carry out following tasks at the scene of death:

a) Presence of all people's identity should be recorded at the scene.
b) Death body should be photographed as it is found
c) Any weapon or objects like, bullet, bullet case, cigarette butt, etc. found at the scene should be noted and collected for further investigations.
d) Identification of death body and information regarding those who have seen the decedent last alive from the scene witness should be obtained.
e) The hand and feet of the deceased should be protected by using paper bag, until it reaches to the mortuary for further investigation.
f) The integrity of the scene and surrounding should be preserve by cordoning.

2.3. Role of the medico-legal expert:

The medico-legal expert should without delay:

a) Circumstance of death should be well informed.
b) Proper photographic documentation of body should be undertaken.
c) Make a note of position of body in relation with fixed objects, records the clothing, all visible injuries and distribution of rigor mortis, livor mortis and state of decomposition.
d) Blood stain pattern over the body and surrounding at the scene should be noted and collect all biological materials as evidence.
e) Preliminary examination of body need to be done.

f) Try to estimate time since death from a record of rigor mortis, livor mortis and stage of decomposition.
g) Transport the body to the morgue in a secure manner and temporarily store until further examination is done.

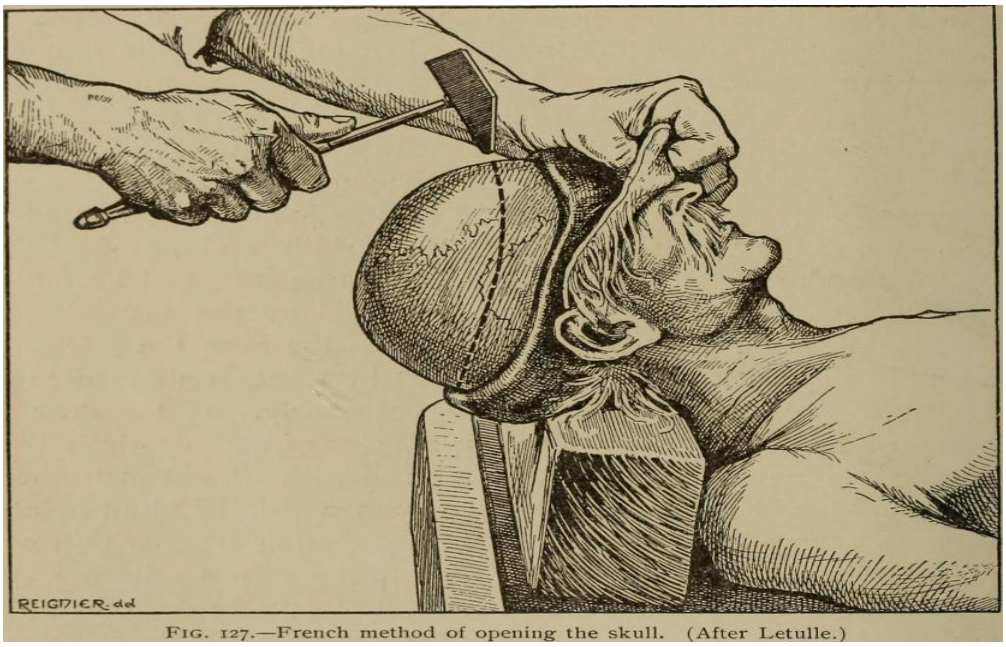


FIG. 127.—French method of opening the skull. (After Letulle.)

3. Identification

The general Assembly of Interpol in 1997, they have come up with the following criteria for the proper identification of the body during the Mass Disaster:

a) Visual Recognition
b) Personal Effects
c) Physical Characteristics
d) Dental Examination
e) Anthropological Identification
f) Fingerprints
g) Genetic Identification.

3.1. Visual identification;

It is usually carried out by the close relatives of the deceased or any person who has seen him / her recently.

3.2. Personal effects;

Proper documentation of the clothing's, pocket contains; personal belongings (jewelry, wrist watch, ID card, ATM cards) may help in narrow down the identification.

3.3. Physical characteristics;

The external and an internal examination are recorded for physical characteristics.

3.4. Dental examination;

Forensic odontologist or trained dentist should carry out proper examination of teeth and jaws.

3.5. Anthropological identification;

In all skeletonized human remains anthropological identification becomes crucial.

3.6. Fingerprints;

It is usually done by finger print experts and forensic doctor should assist in obtaining finger prints from deceased.

3.7. Genetic identification;

When all measures for identification becomes inappropriate, genetic identification should be carried out by an expert in DNA analysis.

Caution should be taken to avoid contamination and proper storage of biological samples.

4. General considerations:

1. All the medico-legal autopsies should follow the integrity of medical ethics and maintain the dignity of the deceased.
2. It is always good practice to give an opportunity to the relatives, to grieve and to pay their respect for their loved one before autopsy procedure.

Minimum measures should be taken before commence of autopsy examination:

a) Give each body for a unique case number,
b) Make a note of date and time of body received
c) Make a note of date, time and place of autopsy
d) Make a note of date, time and reference number of requisition letter from where it has been issued.
e) Record the name of experts and assistants and any persons present at the time of autopsy with their proper designation.
f) All the relevant findings should be photographed with scale and case number with and without clothing.
g) After undressing, clothing and personal belongings should be recorded and any damages over the clothing should be verify that corresponds to the injuries over the body.
h) X-ray examination should be considers in cases of any firearm injuries, complete charred body, suspected child abuse and identification and location of foreign objects.

(viz PMR/NG/21/200/2023)

3. All the body orifices have to be examined and take an appropriate swab for biological trace evidence, before internal examination.
4. All medical records must be obtained, if the deceased has been treated at the hospital.

Furthermore this manual shall cover all the procedures as to how to collect, preserve and dispatch the samples for multiple purposes.

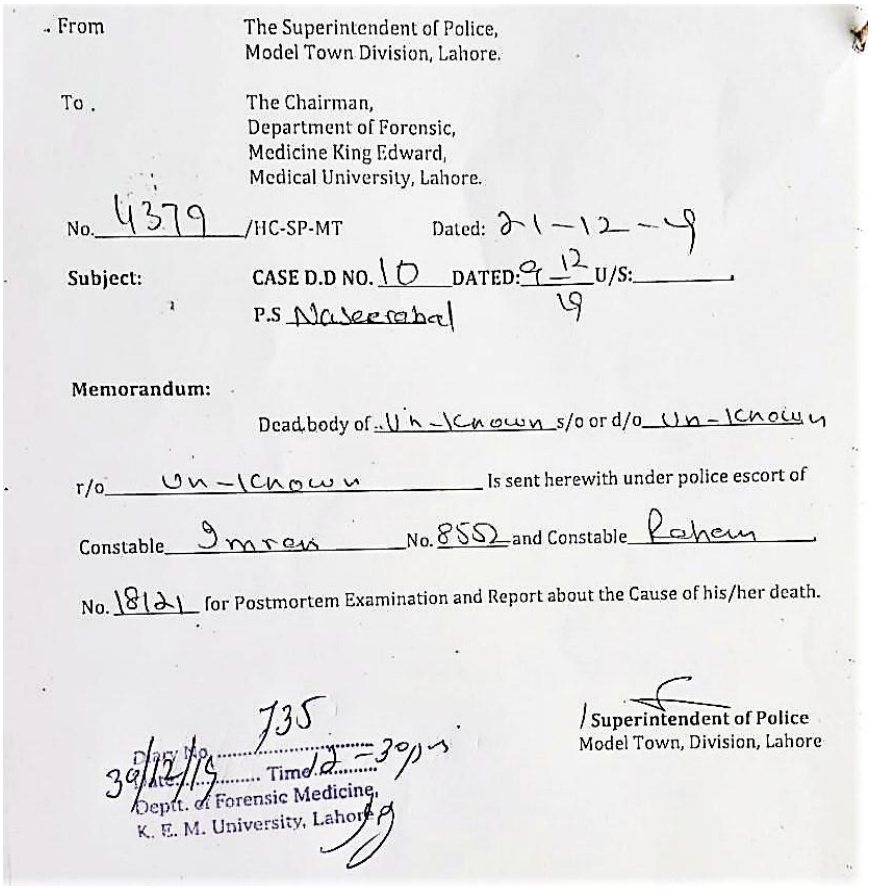
5. Autopsy procedures:

5.1. Preliminary for Autopsy examination:

1. Authorization letter
2. Registration
3. Photography
4. External examination
5. Internal examination
6. Ancillary investigation
7. Cause of death
8. Handover of the body with dignity
9. Autopsy reports

5.2. Authorization letter / Docket

The necessary documents authorizing the examination, from Nepal Police, as well as other documents including medical record, if available, should be acquired.



From The Superintendent of Police, Model Town Division, Lahore.

To. The Chairman, Department of Forensic, Medicine King Edward, Medical University, Lahore.

No. 4379 /HC-SP-MT Dated: 21-12-19

Subject: CASE D.D NO. 10 DATED: 9-12-19 U/S: _____, P.S Naseerabad

Memorandum:

Dead body of Un-known s/o or d/o Un-known r/o Un-known Is sent herewith under police escort of Constable Imran No. 855 and Constable Rahim No. 18121 for Postmortem Examination and Report about the Cause of his/her death.

Superintendent of Police
Model Town, Division, Lahore

Diary No. 735
Date 30/12/19 Time 12:30 pm
Deptt. of Forensic Medicine,
K. E. M. University, Lahore

5.3. History:

In all case of found dead and sudden dead history should include:

5.3.1. Circumstances of death:

Date, Time and Place of death (e.g. at home, at rest, after ingesting medication or food, during exercise)

Whether the death occurred under suspicious circumstances

5.3.2. **Past medical History**

General state of health,

Significant past medical disease (e.g.)

i. Hypertension
ii. Diabetes
iii. Ischemic heart disease
iv. Malignancy
v. Sickle cell disease

vi. Chronic Obstructive Pulmonary Disease (COPD) vii.Tuberculosis
vii. Chronic renal failure
viii. Occupational lung disease
ix. Peptic ulcer disease
x. Inflammatory bowel disease
xi. Psychotic or depressive diseases

5.3.3. History of Medication

i. Antipsychotic drugs
ii. Cardiac drugs.

5.3.4. History of narcotic drug or alcohol abuse

5.3.5. Family History

i. Genetically transmitted disease
ii. Ischemic heart disease
iii. Emphysema
iv. Diabetes
v. Hypertension, etc.

5.3.6. History of Recent Surgical Interventions

i. Cardiac surgery
ii. Intervention cardiac procedures
iii. Barium enema Endoscopic procedures
iv. Bronchoscopic biopsies,etc.

6. Investigation Findings

i. ECG findings
ii. Serum electrolytes
iii. Blood urea/ serum creatinine
iv. Radiological findings
v. (Chest X-ray, ultrasound examination, CT scan)

ابتدائی اطلاعی رپورٹ نسبت جرم قابل دست اندازی پولیس رپورٹ شدہ زیر دفعہ 154 مجموعہ ضابطہ فوجداری

مقدمہ نمبر 24 — 141872

تاریخ و وقت وقوعہ — تھانہ صدر گوجرہ — ضلع ٹوبہ ٹیک سنگھ

1	تاریخ و وقت رپورٹ	17	6	تھانہ سے روانگی کی تاریخ و وقت	[illegible]
2	نام و سکونت اطلاع دہندہ و مستغیث	محمد ارشد ولد محمد اسماعیل ساکن 369 ج ب			
3	مختصر کیفیت جرم (معہ دفعہ) و مال اگر کچھ کھویا گیا ہے	جرم 324/109، 148/149 ت پ			
4	جائے وقوعہ و فاصلہ تھانہ سے اور سمت	چک نمبر 369 ج ب			
5	کارروائی متعلقہ تفتیش اگر اطلاع درج کرنے میں کچھ توقف ہوا ہو تو اس کی وجہ بیان کی جاوے۔	حسب آمد درخواست			

SADDAR

ابتدائی اطلاع نیچے درج کرو

دستخط عبدالغفور 304 عہدہ محرر

نوٹ۔ اطلاع کے نیچے اطلاع دہندہ کا دستخط یا مہر یا نشان انگوٹھا ہونا چاہیے اور افسر تحریر کنندہ ابتدائی اطلاع کے دستخط بطور تصدیق ہونے چاہئیں۔

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Govt. Printing Press, Punjab, Lahore

6.1. Registration.

All the body brought into the mortuary should be registered with a unique identification code.

The unique identification code could include FM – 2074 - 0123 Identification code for institute E.g. – FM – Forensic Medicine Year of examination

Case number E.g. – 0123 – Case # 123 for the current year

The body should be tagged with label bearing the unique identification code.

The labels used should be written in permanent, indelible ink on a water proof tag.

The personal details should not be included on the tag.

The personal details should be registered on a registration form. The documents should all be included in a folder and confidentiality of the documents maintained.

6.2. Photography

Photography should be carried out in a systematic and clock-wise manner and overall view, mid-range and close up should be taken in every case.

a) Overall view – for seeing relationship of body or injury with other objects.
b) Mid-range - relationship photograph with other immediate body part.
c) Close-up – for detail of injury or item in view

All photographs should be taken with reference number and.

6.3. Total body photographs – Front, back and both sides

6.3.1. Routine

a) Face
b) Face and trunk
c) Groin and thigh
d) Lower limbs from front
e) Back of body.

Specific – Injury/lesion in relation to body; close-up shots.

7. Cause of death findings

7.1. External Examination

a) Length and body build
b) Complexion
c) Colour of the hair and eyes

7.2. Secondary sexual characteristics

7.2.1. Male

i. Beard and moustache
ii. Axillary hair
iii. Pubic hairs
iv. External genitalia

7.2.2. Female

i. Breast
ii. Areola
iii. Nipple.

7.3. Identification Marks

i. Scars
ii. Tattoos
iii. Moles etc.

7.4. Signs of treatment

i. ECG leads
ii. IV Cannulation
iii. DC Defibrillator Marks, etc.
iv. CPR Attempts

7.5. Any obvious disabilities

i. Amputated Limbs
ii. Contractures

8. General Examination;-

i. Pallor
ii. Jaundice
iii. Cyanosis
iv. Swelling of the limbs
v. Xanthelasma
vi. Rashes,
vii. Petechial haemorrhages, etc.

9. Post-mortem changes-

i. Rigor mortis (jaw, neck, all joints)

ii. Livor mortis (site, colour and fixed or blanched)

iii. Signs of decomposition (purging, greenish discoloration, gaseous distension, marbling, skin peeling, etc.)

10. Description of Injuries:

10.1. Type

(Blunt / Sharp / Burn / Firearm)

10.2. Size

(Two dimension in cm /length x width)

10.3. Anatomical site

i. Exact location (from fixed land mark, e.g. From top of head and ante/posterior-midline)
ii. Age of injury (color / signs of healing)

10.4. Contamination

(Extraneous materials, e.g. dirts, vegetation, etc.)

10.5. Edge

(Clean cut/ irregular/ ragged)

10.6. Depth

(Anatomical layer, e.g. skin, subcutaneous, muscle or bone deep)

10.7. Direction

(Anatomical plane e.g.
forward/downward/medially/laterally/horizontal/vertical/etc.),

10.8. Pattern /Shape

(Imprint of objects), etc.

11. Internal Examination:

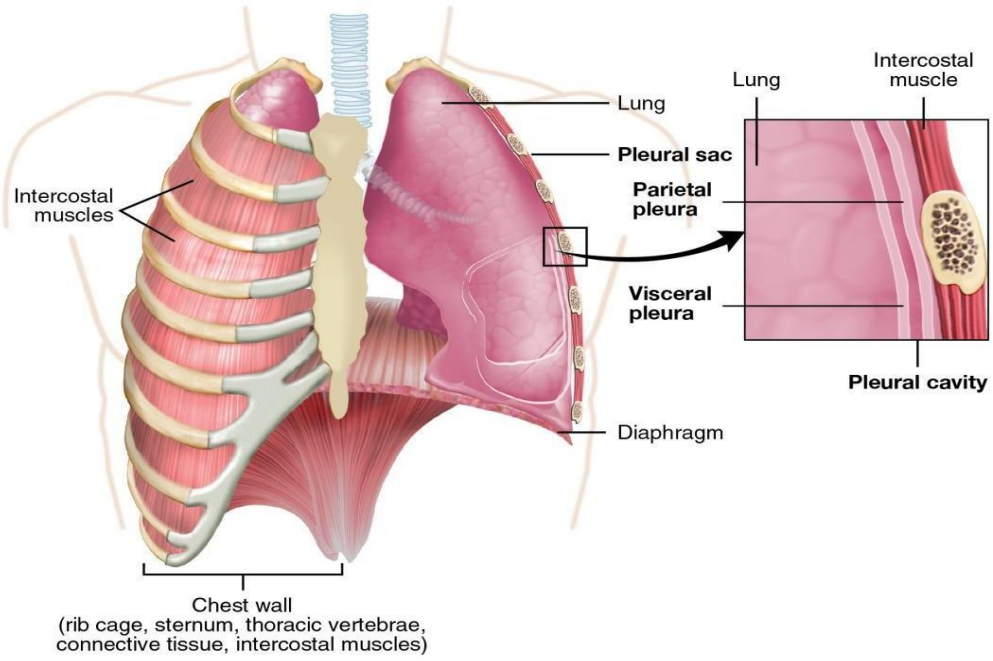
11.1. Evisceration:-depending on case

i. Leutelle method
ii. Virchow method
iii. Ghon method
iv. Rockystansky method

11.2. Examination of chest cavity:

1. Pleural cavity- Examine for the nature of the effusion ;
   i. Color of fluids
   ii. Blood stained,
   iii.. Pus,
   iv. Whitish

11.2.1. Examine for Pneumothorax



11.3. Examination of the heart:

11.3.1. The pericardial cavity;

i. Effusions
ii. Adhesions
iii. Hemopericardium.

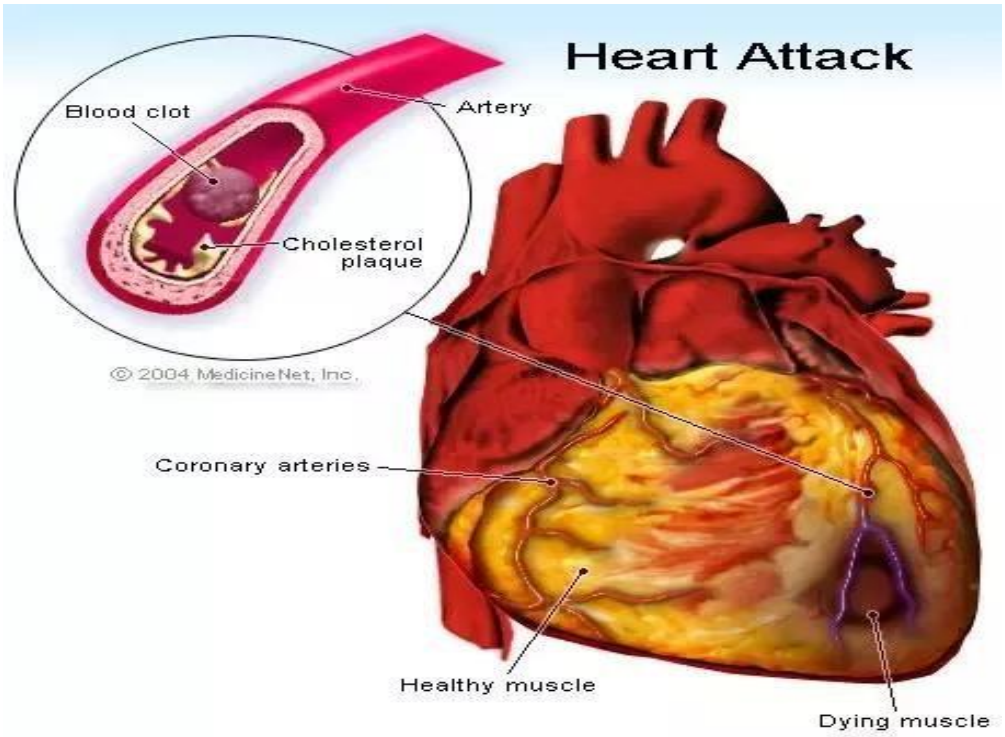
11.3.2. Examine right atrium, right ventricles and great vessels-

Air embolism in the great vessels –

a) Inspect for origin
b) Transacted for thrombi
c) Emboli.

11.3.3. The major coronary arteries and their branches-

i. Origin and its distribution,
ii. Occlusion
iii. Calcification
iv. (The coronary arteries cut at 3mm intervals transversely
v. To look for occlusion, obstruction by thrombi and calcification)
vi. The aorta, pulmonary artery and coronary ostia should vii.be examined for any abnormalities

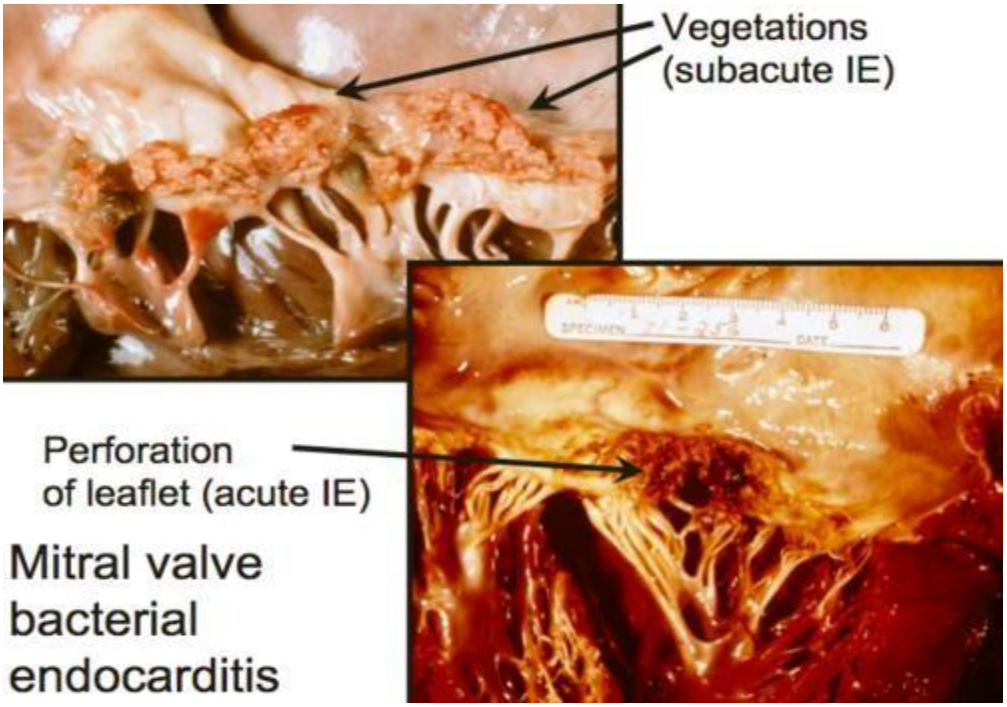


11.3.4. Cardiac chambers can be open

Long axis method (cut apex to base)

Short axis (cut perpendicular to inter-ventricular septum) or the atria should be opened into and the valves should be checked for

a. Thrombi
b. Vegetation
c. Valvular abnormalities
d. Congenital abnormalities
e. Abnormality of the valve rings,(e.g. bicuspid valves)
f. Valve rupture/ papillary muscle rupture in ischemic heart disease.



11.3.5. Short axis-

The ventricle should be cut at 1 cm intervals from apex to mid ventricular level and cut open in the direction of blood flow to look for

a. Symmetry
b. Ischemic/ hemorrhagic lesions
c. Fibrosis
d. Thrombi
e. Aneurysms
f. Hypertrophy.

The thickness of the myocardium should be measured in the posterior wall of the left ventricle (approximately 1 cm below the mitral valve) and at the septum.

The weight of the heart should be measured after emptying the blood and correlated with age, sex and body weight of the individual.

Representative blocks from lesions in the myocardium of the posterior wall of the left ventricle and septum in cases of ischemic heart disease and cardiomyopathy.

Other relevant tissue based on observations.

11.4. Examination of the lungs:

11.4.1. Pleura -

a) Adhesions (past infection)
b) Nodules,
c) Plaques (asbestosis)
d) Tumour (e.g. mesothelioma)

Each lung should be separated across the main bronchi at the level of bifurcation of the trachea.

11.4.2. Trachea-bronchi should be longitudinally cut open up to look for ;

a) Collected secretions
b) Foreign bodies
c) Dilatation (bronchiectasis)
d) Inflammation (Bronchitis)
e) Mucus plugs
f) Casts and mass (tumour).

11.4.3. Lungs should be examined externally for;

a) Haemorrhagic spots (in asphyxia)
b) Pleural thickening (past infection)
c) Adhesions (infection)
d) Puckering (underlying tumour)

11.4.4. Lungs should be cut in the coronal plane from hilum to the pleura, washed and examined for;

a) The consistency of the cut surface,
b) Areas of consolidation,
c) Abscesses,
d) Apical cavities,
e) Fibrosis,
f) Emphysema,
g) Caseous necrosis, and mass (tumor)

Presence of enlarged hilar nodes, their consistency and the presence of caseation should be noted.

Each lung should be weight after dissection.

11.4.5. Examination of the Abdominal Cavity:

Abdominal cavity- Examine for;

a) Collection of fluids
b) Collections of pus,
c) Blood and clots
d) Stomach contents/Fecal matter,
e) Rupture of a hollow viscus,
f) Evidence of recent surgical intervention
g) Presence of mesenteric nodules,
h) Tumour deposits.

12. Examination of Gastrointestinal system

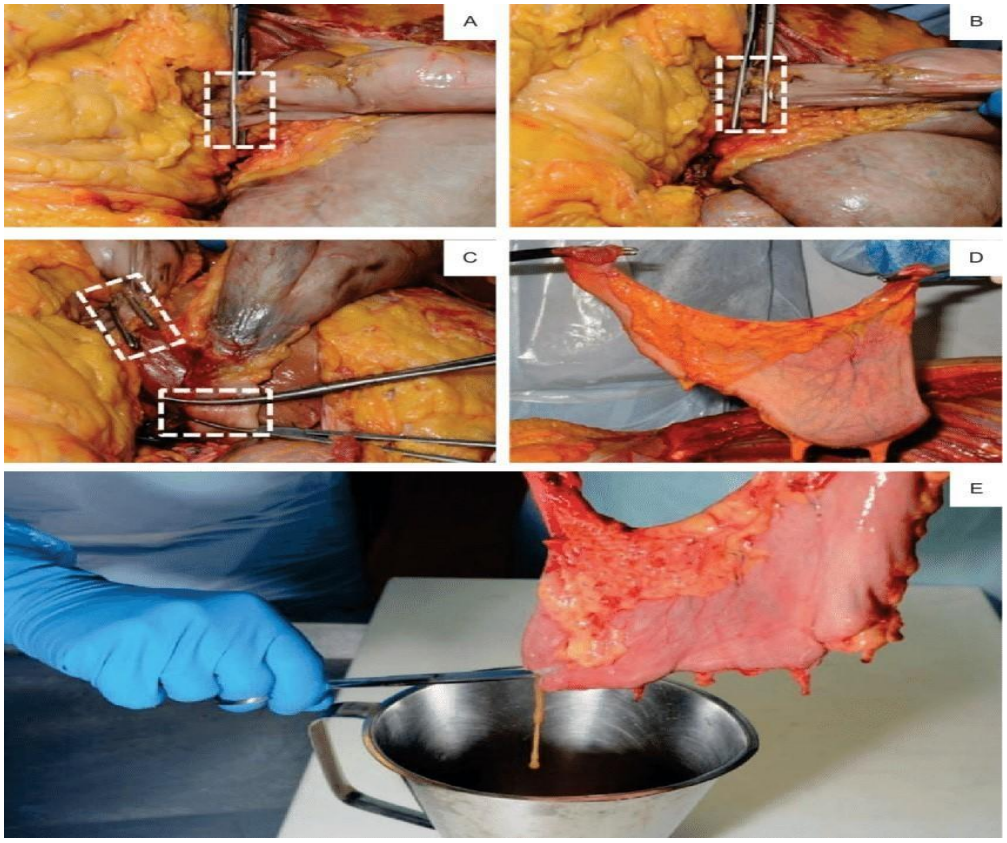
12.1. The mouth, tongue and oesophagus should be examined for;

a) Ulcers,
b) Injuries
c) Mass/ Tumors.

12.2. The stomach

a) Separated at the cardiac and the pyloric ends.
b) Placed in a container and opened along the greater curvature.
c) The contents of the stomach should be collected, the colour, smell and presence of blood should be noted, and the contents collected and sent for further investigation if necessary.
d) The internal surface of the stomach should be examined for

erosions, ulcers and mass (tumor).



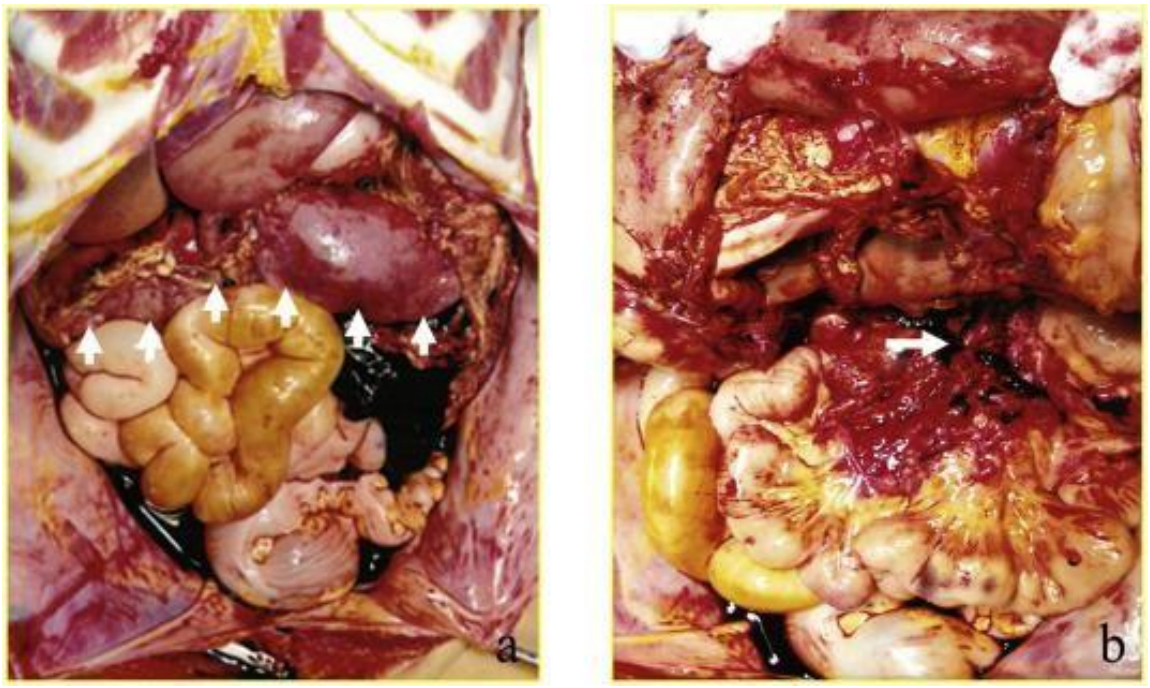
13. Examination of the intestines-

The entire intestine (small and large) should be cut open and the cut surface examined for

i. Injury
ii. Ulceration
iii. Strictures
iv. Toxic dilation
v. Volvulus
vi. Gangrene
vii. Tumours.

13.1. The mesentery should be examined for

a) Haemorrhage
b) Injury
c) Tumour Deposits.

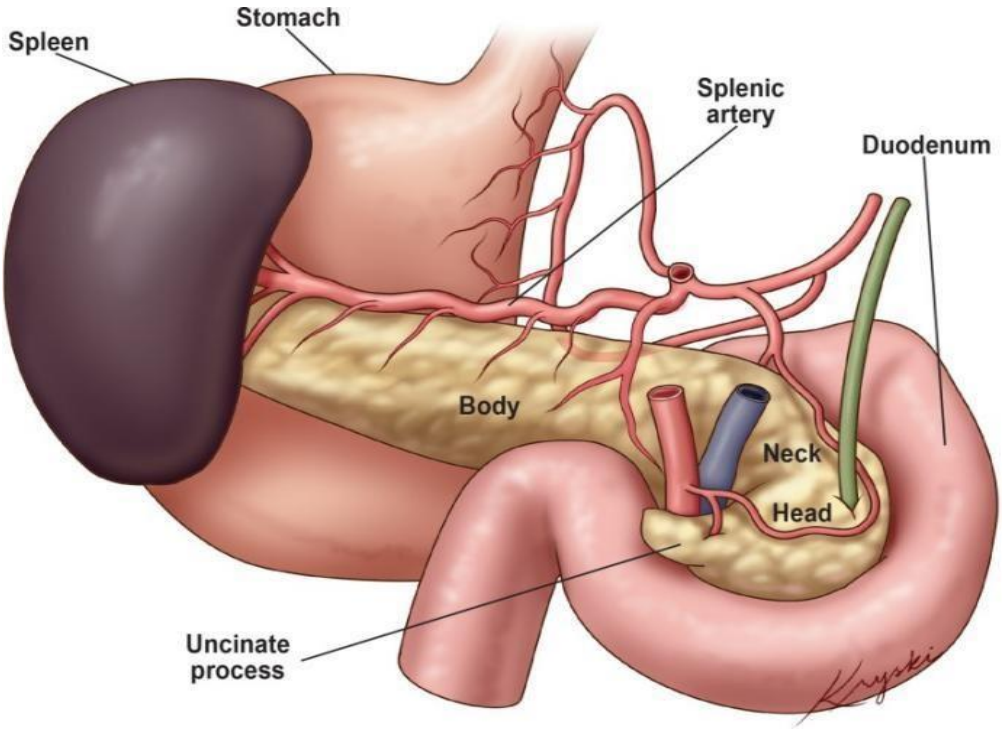


13.2. Examination of the Hepato-biliary System and Pancreas The liver

a) Should be separated, weighed and sliced at 1cm intervals.
b) Note the colour and consistency of the liver.
c) Examine for injury, fatty change, cirrhosis, cystic lesions and primary or metastatic tumour.
d) The gall bladder is dissected with the biliary tract up to the opening at the duodenum.
e) The patency of the biliary tract, presence of stones or tumour in the gall bladder or biliary tract is noted.

14. The pancreas

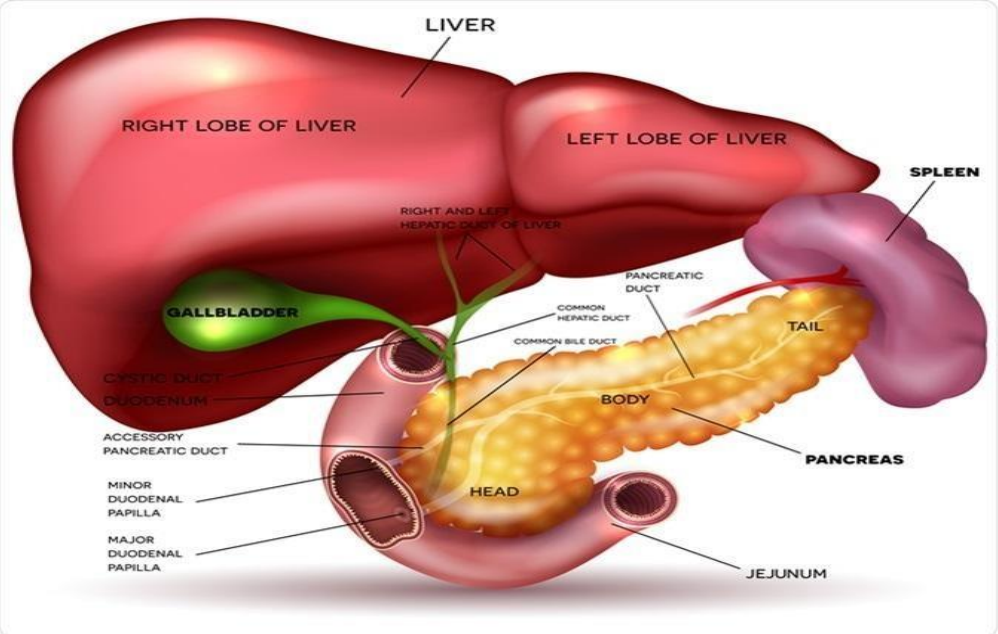
a) Should be opened in the longitudinal axis.
b) Examine the pancreas for haemorrhage, necrosis and tumours
Representative samples from suspected areas including the hilar region.



15. Examination of the Spleen

a) Should be separated at the hilum and weighed.
b) Should be sliced at 1 cm intervals.

c) Examined for rupture, infarction, diffuse nodularity, and focal lesions.



16. Examination of the kidneys, ureters and bladder

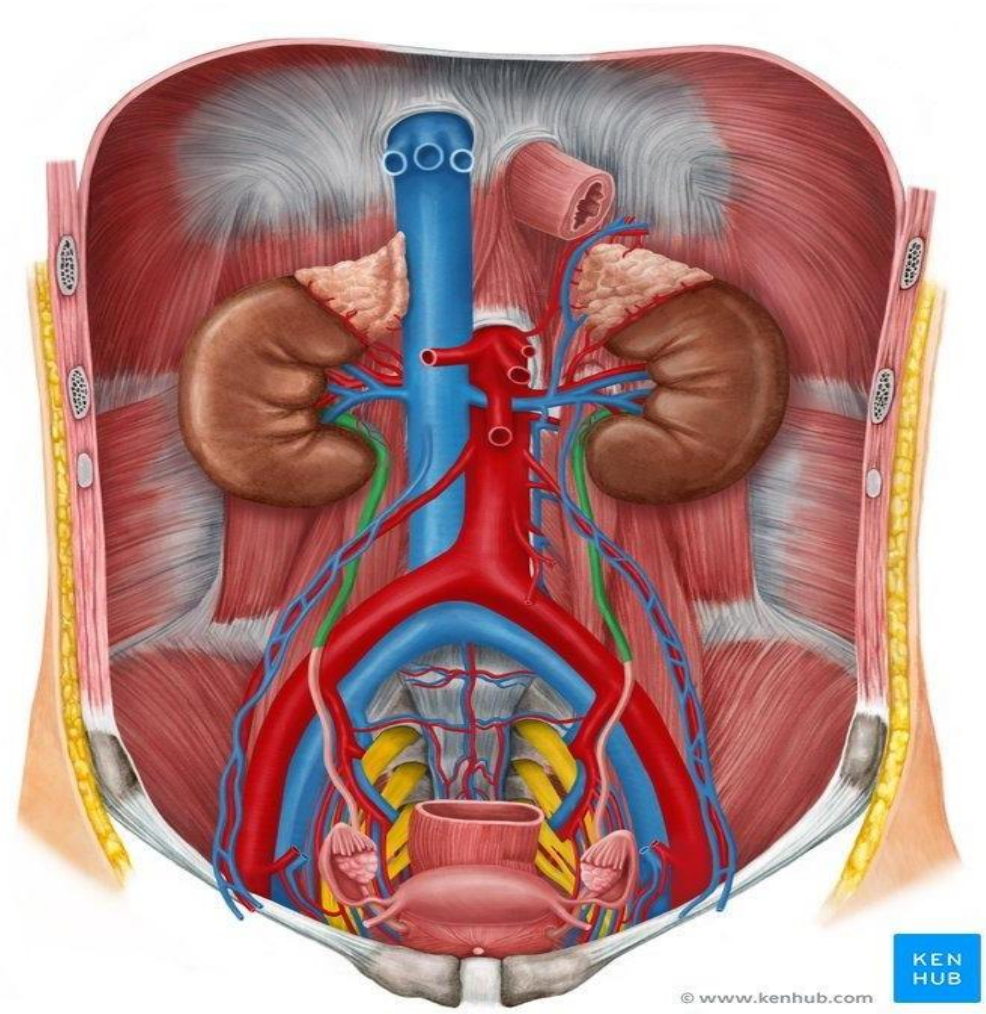
The kidneys, ureters and bladder can be dissected en- bloc or separately.

The kidneys are separated from the adrenals and each kidney weighed separately.

The renal artery is examined for stenosis.

The capsule of the kidney should be stripped and the surface examined for

a) Nodularity
b) Scarring,
c) Cysts,
d) Petechial haemorrhages,
e) Abscess formation.



16.1. The kidneys should be cut open longitudinally and examined for

a) Calculi,
b) State of the pelvis,
c) Corticomedullary demarcation,
d) caseation,
e) Abscess formation, or tumour.

16.2. The ureters are opened longitudinally and examined for

a) Patency,
b) Calculi,
c) Pus,
d) Focal lesions
e) Tumour.

16.3. The bladder contents should be syringed out and the bladder cut open to look for

a) Injury,
b) Calculi,
c) Hypertrophy of the bladder wall,
d) Haemorrhage or tumour.

17. Examination of the pelvic organs

i. After the completion of abdominal evisceration, the prosecutor first give a diamond shaped incision over the skin enclosing the external genitalia.

ii. The incision should penetrate into the deep soft tissue bounded laterally by ischio-pubic rami, anteriorly by the pubic symphysis, and posteriorly by the coccyx.

iii. The internal incision is given along the pelvic inlet, enclosing the pelvic organ.

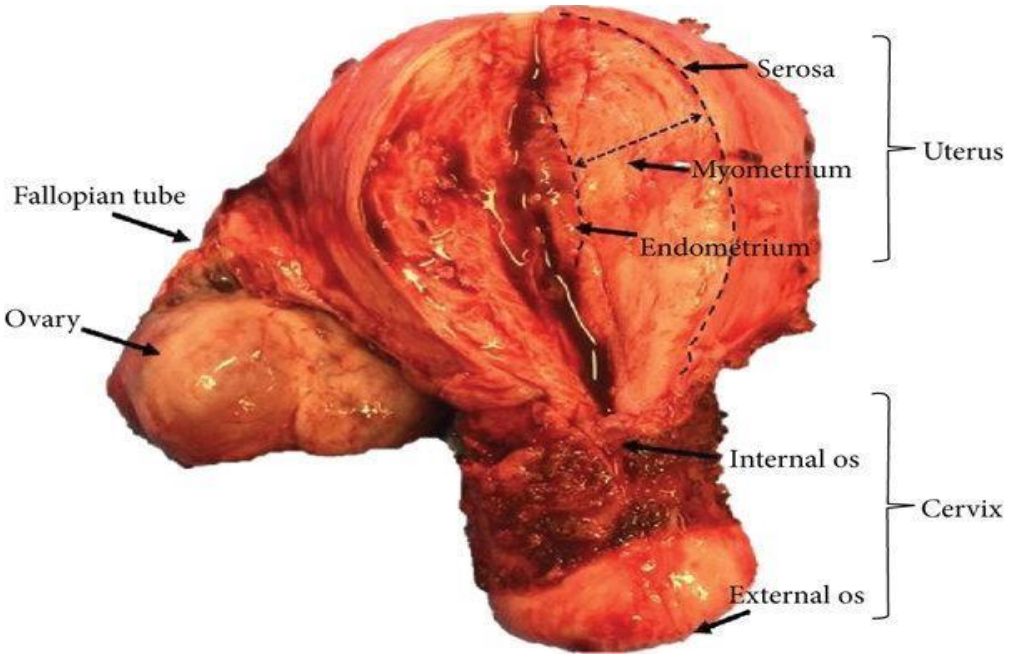
iv. The rectum and adjacent soft tissues are dissected away from the sacrum and urinary bladder is dissected away from the pubis. The pelvic organs including

the bladder, urethra and rectum, with vagina, cervix, uterus, fallopian tubes and ovaries in the female, and the prostate and the testes in the male are dissected out.

17.1. Uterus, fallopian tubes and ovaries

The uterus should be weighed and examined for

a) Evidence of pregnancy,
b) Abortion,
c) Products of conception,
d) Foreign bodies
e) Instrumentation,
f) Rupture,
g) Haemorrhage,
h) Placental parts
i) tumours.



The fallopian tubes should be examined for ectopic pregnancy or tumour.
The ovaries should be weighed and examined for corpus luteum, cysts or tumour.
The entire block can be subjected for histopathological analysis to rule out any pathological lesions or product of conception.

17.2. Prostate and testes

i. The prostate should be dissected out through the abdomen after making an incision at the pelvic outlet, weighed and examined for tumour.
ii. The testis is removed by making a small incision in the inguinal canal and

pushing the testes out of the inguinal canal.

18. Examination of the Brain

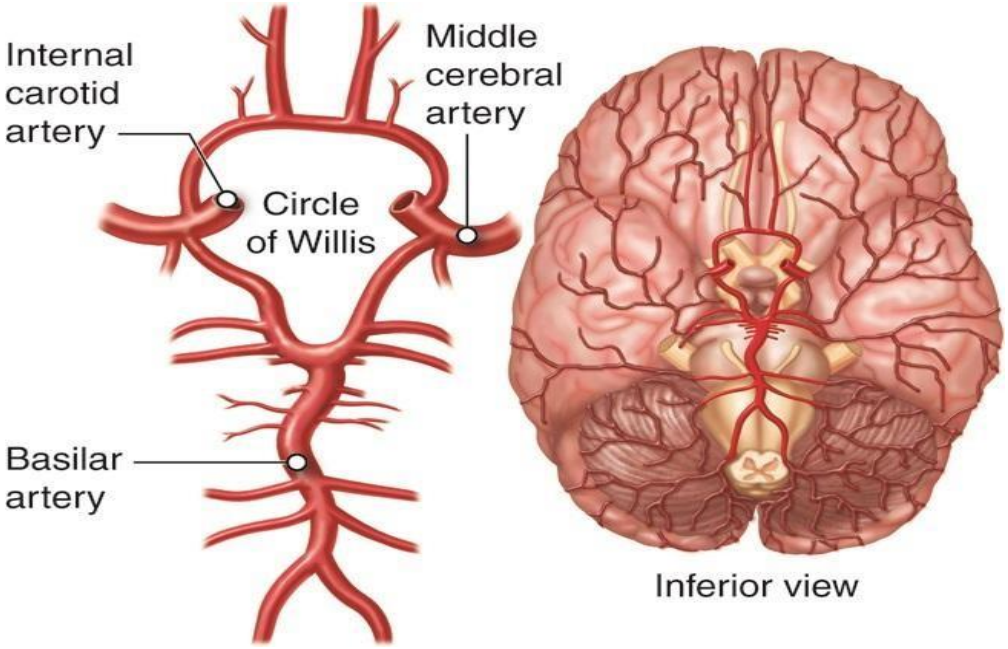
The scalp incision is made joining the mastoid processes across the vertex and the scalp reflected making note of any hemorrhage or other abnormalities.

The skull is opened with a saw by a horizontal incision at the level of glabella, extending backwards at the level of pterion, up to the occiput.

The tentorium, blood vessels and nerves at the base of the skull are cut and the brain separated from the spinal cord at the deepest level while supporting the brain with palms and fingers. The tentorium is examined for haemorrhages.

The Circle of Willis should be carefully dissected out and opened longitudinally to examine for thrombosis, atherosclerosis and aneurysms.

The brain should be weighed and examined externally for areas of haemorrhage, injury, flattening of gyri and narrowing of sulci in cases of increased intracranial pressure.



The levels of the slices should include the anterior margin of the temporal lobe, anterior margin of the optic chiasma, mammilary bodies, midbrain at the posterior end of the substantia nigra, and occipital lobe. The slices should be examined for

a) Asymmetry,
b) Areas of haemorrhage,
c) Cystic lesions,
d) Cavity formation from infarction,
e) Ventricular dilatation,
f) Blood in ventricles
g) Abscesses.

The cerebellum is cut in the coronal plane and the nuclei examined for haemorrhages and infarction.

The brain stem is sliced at 4mm intervals and examined for haemorrhages, infarctions and tumour.

19. Examination of the spinal cord

Examination of spinal cord not routinely carried out, it is performed in special circumstances where pathology of the spinal cord is suspected.

Posterior approach of spinal cord examination the body is placed face down on the autopsy table.

A mid line skin incision is made from the occiput to the buttocks. The posterior

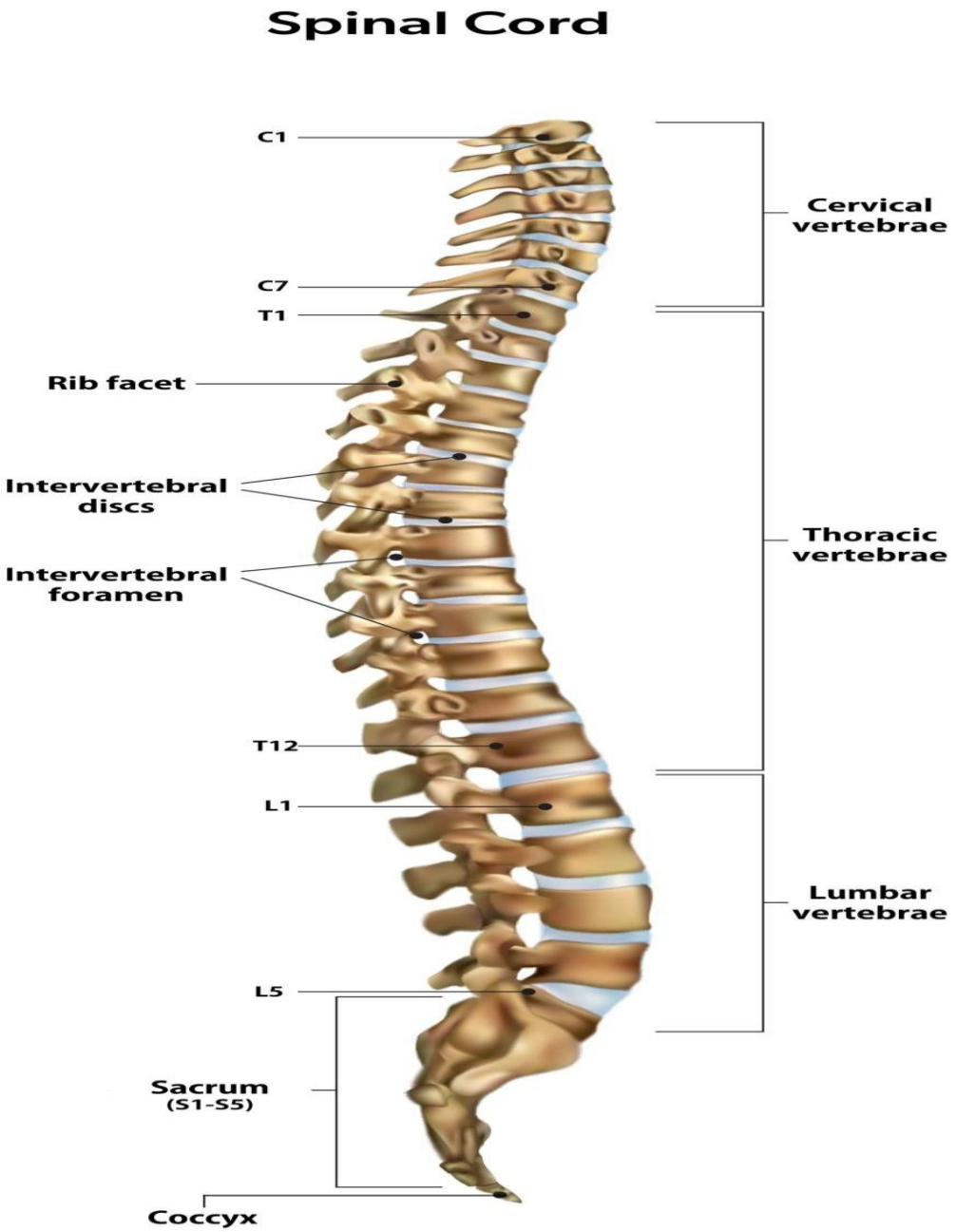
vertebral muscles are separated up to the vertebral column.

The posterior laminae with their interconnecting ligaments are cut with a saw and the posterior wall of the spinal cord is removed.

The spinal cord should be carefully dissected out.

Better result can be obtained by examined after fixation in formalin for weeks.

It should be cut at 4mm slices or less and examined for the suspected pathology.



20. Ancillary investigation

For toxicological analysis

a) Peripheral blood
b) Stomach with its entire content,
c) Each half of kidneys
d) At least 200gms of right lobe of liver
e) In case of advance decomposition muscles can be preserved for toxicological analysis. (Collect and preserve in saturated sodium chloride solution)

21. For Histological Examination

Tissue sample from solid organs (depending on case equirement);

a) Brain,
b) Heart,
c) Lungs,
d) Kidney
e) Spleen (Collect and preserve in formalin).

22. X-ray examination should be considered

a) All infant death,
b) Firearm injuries,
c) Charred body
d) Death from explosives injuries

All the biological samples must be collected in tightly closed jars, well preserved and sealed with labeling and transported, strictly maintaining chain of custody.

23. Release of the body

The body should be hand over to the family member with dignified condition, after complete medico-legal examination done by the doctors.

Finally the embalming techniques and the restorative art shall be discussed as an essential part of the curriculum for a complete comprehensive understanding of the subject.

CHAPTER 1

POST MORTEM STANDARD OPERATIONAL PROCEDURES

1. Autopsy Procedures

Autopsies will follow procedures according to standardized guidelines, subject to reasonable deviations to tailor the inquiries to the specific features of the case at hand, and to allow for professional judgment.

Departmental autopsies will be completed routinely as follows: A complete autopsy is defined to include a detailed external examination of the entire body and an internal examination to include the removal and dissection of all thoraco-abdominal and neck organs opening the head with the removal and examination of the brain.

A complete autopsy does not require histologic examination or toxicology analysis,

While performing autopsy procedures, the autopsy assistant is under the direct supervision of the Medical Examiner.

The autopsy assistant should remain present in the autopsy suite until the autopsy procedure is complete or until they have been excused by the Medical Examiner.

2. External Examination

This is not a standard procedure and can only be conducted on specific request of the Police Department who can either dispose of the body to the relatives or to anatomy department for academic purposes

An external examination is defined as a detailed description of the decedent's remains including scars, surgical incisions, medical devices, tattoos, etc.

3. Pre-Autopsy Procedures

Prior to autopsy the mortuary assistant will set up the autopsy work station according to the case examination status including

i. Preparing tables for body dissection
ii. Preparing instruments
iii. Preparing specimen containers and collection tubes
iv. Preparing paperwork for daily caseload and taking radiographs.

Autopsy work stations should be basically set up with the following

instruments and supplies, in certain cases it will be necessary to equip the autopsy work station with specialized instruments or additional supplies.

3.1.1. Dissecting board

3.1.2. Cutting instruments

a) scalpel handle – short
b) scalpel handle – long
c) dissecting scissors
d) rib cutters/bone shears
e) dura strippers
f) sharp knife – long
g) sharp knife – short

3.1.3. Other supplies and sundries

a) Gray Ruler With Case Number
b) Body Ruler
c) Forceps with teeth
d) Forceps without teeth
e) 2 hemostats
f) Long metal pan
g) Round metal pan
h) Viscera Bag
i) Skull key
j) 1-2 b bottle(s)
k) 2 Gray Top Tubes Marked “Heart Blood”
l) 2 Gray Top Tubes Marked “Femoral Blood”
m) 1 Red Top Tube Marked “Vitreous” Fluid
n) 5 Blue Conical Tubes (Labeled Appropriately After Contents Are Entered (Gastric, Liver, Brain, Bile, Urine)
o) 2 head blocks
p) Sharps container
q) Blue cloth towels
r) 2 self-adhesive plastic bags properly labeled
s) Bucket of water w/ detergent and sponge

4. Peri-Autopsy Procedures

1. Remove bodies from body storage cooler and stage in autopsy suite
2. Assist photographer in taking “as is” photographs
3. Undress and transfer remains to autopsy table
4. Remove medical intervention devices and wash remains
5. Assist photographer in taking “autopsy” photographs and “ID photo”

6. Perform initial Y incision
7. Remove chest plate
8. Open thoracic and abdominal cavities
9. Assist medical examiner in performing in situ examination
10. Assist medical examiner in obtaining toxicology specimens (blood, bile, urine, vitreous, gastric, liver, brain)
11. Remove organs en bloc
12. Weigh and record organ weights
13. Open the entire length of the gastro-intestinal tract
14. Elevate head
15. Incise and reflect scalp
16. Remove brain
17. Remove Dura
18. Neck dissection is only done by the medical examiner or under direct supervisor of the medical examiner.
19. Obtain decedent fingerprints

5. Post Autopsy Procedures

1. After organ examination replace body organs
2. Close the thoracic, abdominal and cranialcavities with sutures
3. Clean the body
4. Indicate completion of examination by writing “DONE” on body bag
5. Return body in the custody of the Police
6. Put specimens in designated area depending on processing instructions:
    a. Toxicology samples are put in toxicology refrigerator in the yellow tray labeled “toxicology”
    b. Histology sections are put in the yellow tray on top of toxicology refrigerator labeled “histology”
    c. Microbiology specimens are put in the yellow tray on top of the toxicology refrigerator, labeled “Micro”
7. Thoroughly clean and disinfect autopsy and dissection tables, sinks, drains, instruments, dry erase boards and floor area.
8. Between examinations all instruments and surfaces should be cleaned with a 10% bleach solution.

6. Releasing Remains

1. Confirm in log book that the body is ready to be released and that the receipt of remains screen has been properly completed by the communications unit
2. Print and sign a copy of the Receipt of Remains form
3. Verify personal property being released by having both parties sign off on

the release of personal property form

4. Sign body out of release logbook
5. Have toes tag and receipt of remains form witnessed

NOTE: Unidentified remains cannot be released.

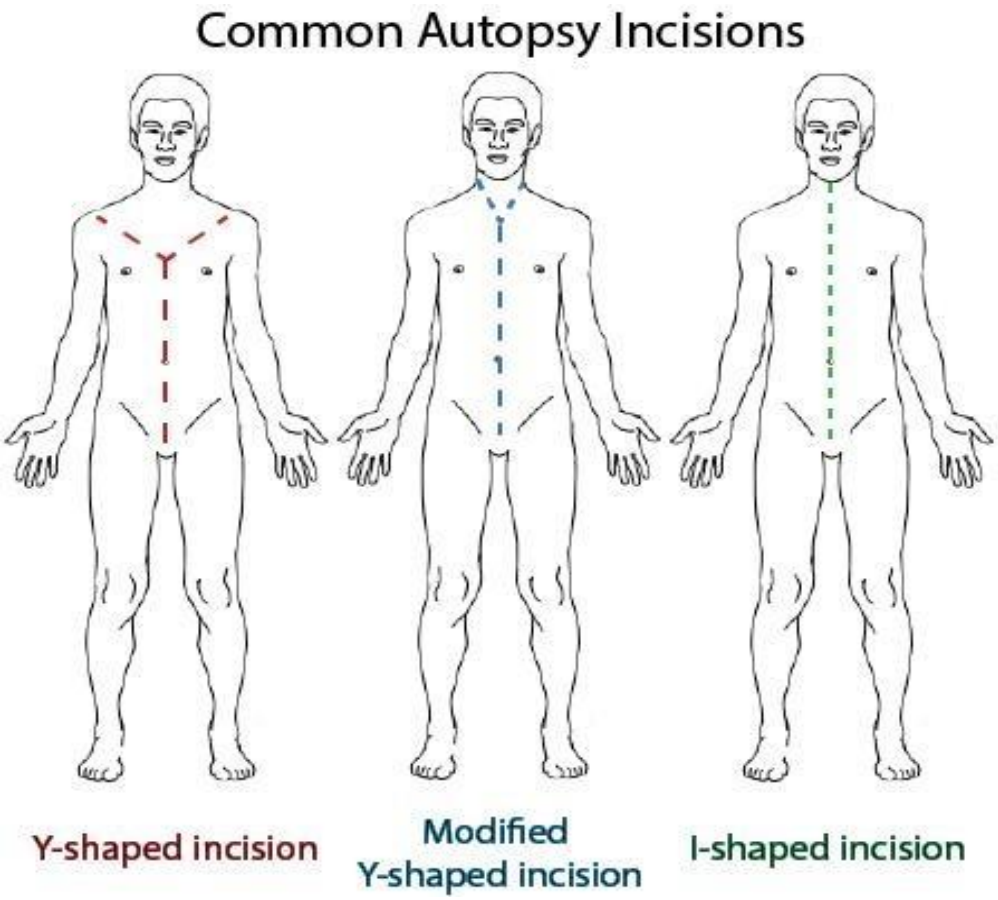
If the remains were identified after intake, the autopsy assistant will print a Departmental label with the decedent identity and have it initialed by both parties as well as a witness.

CHAPTER 2

SPECIFIC POST MORTEM PROCEDURE

2. Conduct of the autopsy

The autopsy is a medical and scientific investigation requiring a high level of knowledge and skill to gain the maximum useful information.



Autopsies must only be performed by a pathologist or by a person qualified as a registered medical practitioner under the supervision of a pathologist.

i. Clinicians should provide pathologists with information that will allow correlation of the clinical and autopsy findings. The information should include written advice of any known hazards which might be presented by autopsy, e.g. infectious agents, radiation.

ii. Where implantable devices such as defibrillators and pacemakers are identified, appropriate advice should be sought with respect to deactivation, removal and interrogation.

2.1. The performance of the autopsy

This must be in accordance with the Police Rules 1934 and Pakistan Penal

Code approved by the Government of Pakistan.

2.2. Extent of the autopsy

The pathologist designated to undertake the autopsy or to supervise the performance of the medicolegal autopsy must be responsible for ensuring absolute compliance with any limitations on the extent of the autopsy specified by the police officials providing the specific documentation regarding the examination.

2.3. Specific Post Mortem procedures

Specific techniques and procedural steps are adopted in various autopsies like:

i. Death due to Firearm
ii. Death due to Blunt Trauma
iii. Death due to Sharp Edge Weapon
iv. Death due to Drowning
v. Death due to Strangulation
vi. Death due to Burns
vii. Damage to Vertebral Column and the Spinal Cord
viii. Abdominopelvic dissection in Criminal Abortion
ix. Dissection of Face

2.4. Specific Procedures (Selected Examples)

a) Asphyxial death (external/internal airway obstructions)

The following procedure is in addition to what described under

2.5. Autopsy Procedure:

2.5.1. Scene visit

a) Scene visit should be carried out as indicated or at least assessment should be done on basis of police report and photographs provided by investigating police officer.
b) All scenes should be visited, accompanied by the police.
c) In the cases of hanging, measurements from ground to the hanging point (Suspension Point), height of the support to reach the suspension point, must be documented.
d) Scene must be examined for signs of violence and circumstantial evidences.
e) Scene visit/assessment is always educative to give clear opinion which saves precious time of medical and investigative personnel.
f) Photography should be taken before moving the body.

2.6. External Examination:

a) Dribbling of saliva; Face, Neck and Clothing
b) Ligature must be described with special reference:

i. Width
ii. Length
iii. Presence of cut ends
iv. Description of the knots (fixed/ slip knots).

a) The ligature mark is very important evidence, as it reproduces the pattern and dimensions of the ligature itself.

b) Description of ligature mark (abradedcontusion) with reference

i. Color
ii. Parchmentized / non-parchmentized
iii. Width
iv. Length
v. Direction
vi. Complete/ incomplete- Encircled.
vii. Peri-ligature injuries

e) Distribution of hypostasis must be described and interpreted in relation to the posture.
f) Comment on the presence of petechial hemorrhages, congestion of head and neck, sub-conjunctival hemorrhages of eyes.
g) Comparison of abraded injury and the ligature must be done.
h) In case of female, external genitalia and anus must be examined for injuries and sexual penetration.

2.7. Internal Examination

a) Neck structures to be dissected layer by layer in a bloodless field, after evisceration of brain and thoracic block to note soft tissue injury.
b) Presence or absence of neck injuries (contusions, hematoma or fractures) over;

i. Soft tissue (platysma, neck muscles)
ii. Blood vessels,
iii. Thyroid cartilage,
iv. Hyoid bone
v. Laryngeal cartilages

c) Special comment must be made on the integrity of the cervical spine.
d) Blood sample for toxicological analysis should be collected, where body found hanging, in suspicious circumstances.

2.8. Drowning/Immersion:

The following procedure is in addition to what described under Autopsy Procedure:

Detail regarding the circumstance of the body found should be documented.

Note carefully the following findings:

2.9. External Examination

a) Body must be examined with Clothes, Shoes and Pocket contents must be documented.
b) Examine for signs of immersions

i. Washer Woman hands and feet
ii. Cutis anserina

c) Presence of cadaveric spasm must be documented
d) Presence or absence of tenacious foam at mouth and nostrils must be documented and photographed is recommended
e) Any injury found on the body must be documented, lesions can occurs due to water animals, injuries due to surroundings (for example rocks and ships),
f) Localization of livor mortis to be noted.

2.10. Internal Examination

a) Precise description of the lungs;

i. Voluminous with rib indentation
ii. Hemorrhagic spots over lungs surface
iii. Weight

b) Tracheobronchial tree examined for;

i. Froth

ii. Extraneous materials (mud or sand particles)

c) Gastric content should be examined and collected.
d) Distant organs like lungs, liver, kidney, brain and bone for the possible demonstration of diatoms and other contaminants should be collected.

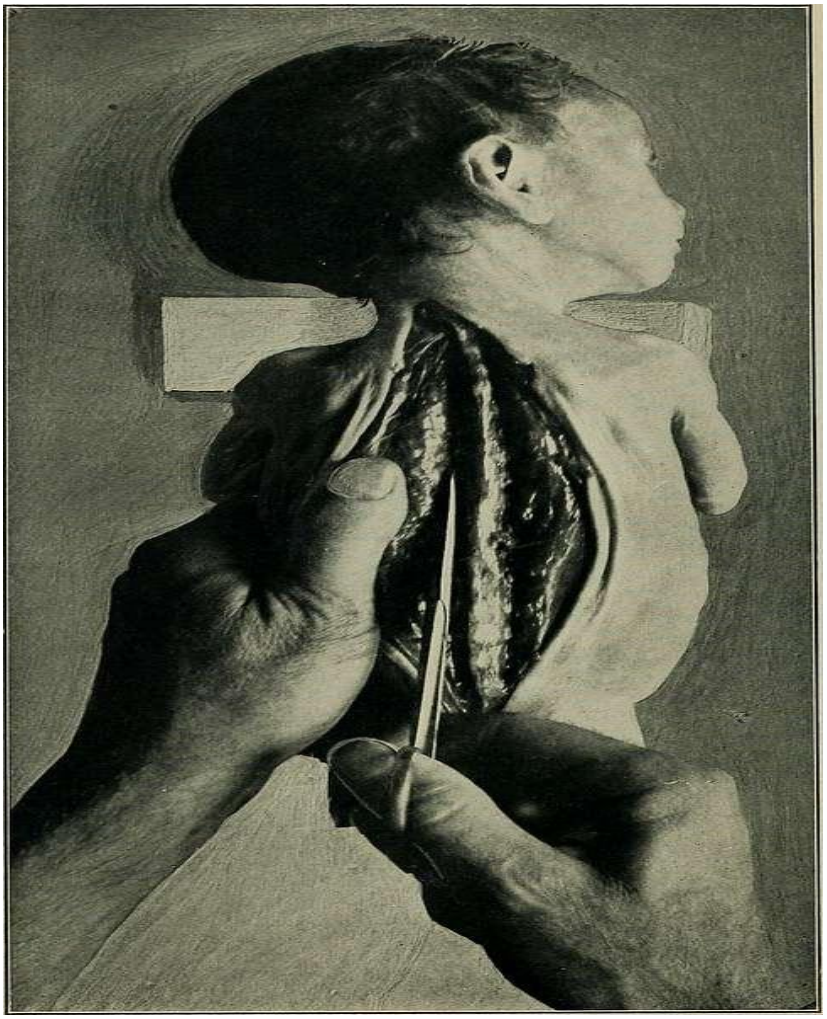
If required, sampling of drowning medium (e.g. river water, pond water) should be carried out.

e) For ancillary investigation, to rule out other causes of death, blood and visceral samples should be collected, depending upon circumstance of cases.

CHAPTER 3

3. FETAL AUOTPSY

Autopsy on a human embryo, fetus, neonate is a topic to be discussed individually as it has exclusive procedural steps which are to be followed in order to establish the age of fetus, status of the fetus that either it was live born or dead born and finally to give the final opinion regarding cause of death.



3.1. Infant death:

The following procedure is in addition to the procedures described under Autopsy procedure.

i. History
ii. Marital status of parents
iii. Antenatal history of the pregnancy
iv. Birth history

v. Post natal complications of the infant and the mother must be looked into in detail.

3.2. Preliminaries

a) If the Placenta is available, it must be examined and necessary samples must be taken for histology and genetic screening. Umbilical cord must be examined.
b) Measurements of baby;

i. Weight
ii. Crown rump
iii. Crown heel length
iv. Head circumference
v. Chest circumference at level of nipple
vi. Abdominal circumference at the level of umbilicus

c) Presence or absence of clothing must be noted.

3.3. External Examination

1. Injuries and abnormalities must be documented and photography must be done. Describe the site of caput succedaneum, Maturity of the baby must be estimated.
2. Any congenital abnormality, incompatible with life must be noted. Examination of Umbilical cord in detail (Length, ends, Watson Jelly). Internal Examination Skill should be applied to remove cerebral hemispheres to examine falx cerebri and tentorium cerebelli to exclude hemorrhage during birth.
3. Cardiovascular and respiratory systems must be dissected en bloc.
4. Special care is to be applied to the thoracic organs:

i. Degree of inflation of the lungs, must be examined for signs of respiration.
ii. Flotation test ‘en bloc’ and ‘en detail’ should perform.
iii. However, the limitations of the flotation test must be appreciated.
iv. Gastrointestinal system must be examined for presence or absence of food materials and samples must be retained for further analysis.

Examine (long bone, sternum and foot bone) centres of ossification (size and presence) for maturity.

All malformations must be described.

The umbilical cord and the placenta must be subject to morphological and

histological examination if require.

3.4. AUTOPSY ON CUSTODIAL TORTURE RESULTING IN DEATH

Autopsy in death due to Gross Human Rights Violation and death due to torture:

3.4.1. Scene investigation:

Whenever possible scene of death should be visited by a doctor and all features documented, using photography, sketch or drawing of circumstance of scene as well as body.

3.5. Autopsy:

The following Protocol should be followed during the autopsy in addition to the procedures described under Autopsy procedure. Preliminary:

a) Serial photographs reflecting the course of the external examination must be included. Photograph the body prior to and following undressing, washing or cleaning and shaving.
b) Photographs should be comprehensive in scope and must confirm the presence of all demonstrable signs of injury or disease commented upon in the autopsy report.
c) X-ray should be considered in case of charred body and gunshot injuries.

3.5.1. External examination:

3.5.1.1. General:

a) The most important portion of autopsy is evidence of external injuries.
b) Document all injuries, record;

i. Size
ii. Shape
iii. Pattern
iv. Location (related to obvious anatomic landmarks)
v. Colour
vi. Direction
vii. Depth and structure involved.

c) Photograph all injuries with unique identification number and scale that is oriented parallel or perpendicular to the injury.

d) Note and photograph;

i. Scars,
ii. Areas of keloid formation
iii. Tattoos,
iv. Areas of increased or decreased pigmentation, Anything distinctive or unique such as birthmarks.

e) Note any bruises and incise them for delineation of their extent.

3.5.1.2. Head and neck:

a) Shave hair where necessary to clarify an injury, and take photographs before and after shaving and washing the site of any injury.
b) Examine the teeth and note their condition.

Record any that are absent, loose or damaged, and record all dental work (restorations, fillings, etc).

Check the inside of the mouth and note any evidence of trauma, injection sites, needle marks or biting of the lips, cheeks or tongue.

Note any articles or substances in the mouth.

c) In cases of suspected sexual assault, save oral fluid or get a swab for spermatozoa and acid phosphatase evaluation.

(Swabs taken at the toothgum junction and samples from between the teeth provide the best specimens for identifying spermatozoa.)

Also take swabs from the oral cavity for seminal fluid typing. Dry the swabs quickly with cool, blown air if possible, and preserve them in clean plain paper envelopes.

d) Examine the nose and ears and note any evidence of trauma, haemorrhage or other abnormalities.
e) Examine the tympanic membranes.
f) Examine the neck externally on all aspects and note any contusions, abrasions or petechia.

3.5.1.3. Chest and abdomen:

a) Note any bite marks;
b) these should be photographed to record the dental pattern, swabbed for

saliva testing (before the body is washed).

c) Bite marks should also be analyzed by a forensic odontologist, if possible.
d) The length of the back and the buttocks must be systematically incised to look for deep soft tissue injuries.
e) Note any injection sites or puncture wounds and excise them to use for toxicological evaluation.

3.6. Extremities:

a) Examine all surfaces of the extremities: arms, forearms, wrists, hands, legs and feet, and note any "defence" wounds.
b) Note any broken or missing fingernails. Save finger nail clippings and any under-nail tissue (nail scrapings).
c) Examine the fingernail and toenail beds for evidence of object having been pushed beneath the nails.
d) Wrists and ankles must be systematically incised to look for deep soft tissue injuries.
e) The shoulders, elbows, hips and knee joints must also be incised to look for ligamentous injury.
f) Carefully examine the soles of the feet, noting any evidence of beating. Incise the soles to delineate the extent of any injuries.

Examine the palms and knees, looking especially for glass shards or lacerations;

3.7. Genitalia:

a) Examine the external genitalia and note the presence of any foreign material or semen.
b) Note any injury to the inner thighs or peri-anal area. Look for peri-anal burns;
c) In cases of suspected sexual assault, examine all potentially involved orifices. A speculum should be used to examine the vaginal walls.
d) Collect foreign hair by combing the pubic hair.
e) Aspirate fluid from the vagina and/or rest, for acid phosphatase, blood group and spermatozoa evaluation.

Take swabs from the same areas for seminal fluid typing.

Dry the swabs quickly with cool, blown air if possible, and preserve them in clean plain paper envelopes;

3.8. Internal examination:

a) The internal examination for internal evidence of injury should clarify.

b) Be systematic in the internal examination as mentioned in autopsy procedure.
c) Deep incision of soft tissues over palms, sole, back, buttocks, all four extremities should be performed to demonstrate soft tissue injuries.

Notes:

a) After completion of the autopsy, record the specimens that have been collected.
b) Label all specimens with the name of the deceased, the autopsy identification number, the date and time of collection, the name of the prosecutor and the contents. d. Carefully preserve all evidence and record the chain of custody with appropriate release forms. e. Perform appropriate toxicological tests and retain portions of the tested samples to permit retesting.

3.9. POST MORTEM IN CASE OF POISONING

3.9.1. Postmortem examination in case of poisoning:

The following procedure is in addition to the procedures described under Autopsy procedure.
In our context toxicological analysis is carried out in case of

3.9.2. Frank case of poisoning

Suspicious deaths when no cause of death is found Suspected poisoning from circumstantial evidence

Air crash (Captain and Co-pilot)

Drivers in case of road traffic accidents and pedestrians. Hospital deaths or death during surgery (to determine the level of drugs given at the hospital).

In case of Hospital stay and treatment:

If the deceased was admitted in hospital then the 1st sample of gastric lavage should be collected, similarly blood and urine sample if available should be collected and sent to Forensic Science lab.

Vomits and vomitus stain over cloths should be collected and send for toxicological analysis.

In cases physical assault and road accidents, blood is usually drawn immediately on admission to the emergency room and sent to the blood bank for typing and cross-match; it should then be retained in the blood bank for at least 2 weeks.

This sample can later be used for toxiclogical analysis if required.

3.10. External Examination:

a) Any abnormal odor from the body should be noted;

i. Petroleum
ii. Organophosphorus poisoning,
iii. Aluminum Phosphide (garlic smell)
iv. Arsenic (garlic smell)
v. Cyanide poisoning (Bitter almond).

b) Suspicious stains over the body and clothes shouldbe collected and sent to Forensic lab.
c) Careful head to toe examination is then carried out;

i. Head hair
ii. (Patchy alopecia is seen in arsenic poisoning, which could be accidental exposure at work),
iii. Nails -(Mees line in heavy metal poisoning,
iv. Skin pigmentation -Heavy metal poisoning,
v. Icterus -Hepatotoxic poisons

d) Any details regarding injuries should be well documented, including;

Burns - (Chemical burns) Puncture marks over the skin.

(In case of puncture marks on skin, surrounding 2cm of skin should be excised and sent to Forensic Science lab)

e) Careful examination of hypostasis should be done as it may indicate certain Poisons;

i. Cherry red-Carbonmonoxide poisoning
ii. Bright red-Cyanide poisoning,
iii. Yellowish or brownish -Phosphorus poisoning.

3.11. Internal Examination

a) The importance of internal examination in case of poisoning or toxin related death is to rule out natural disease processes. The findings of internal examination can also make helps correlate the symptoms produced by the

poison or toxins.

b) Colour of blood should be noted, which is cherry red in case of carbonmonoxide poisoning. Similarly muscles also appear cherry red in case of carbon monoxide poisoning.

c) In case of irritant and corrosive poisons, careful examination of ;

   i. Tongue

   ii. Esophagus

   iii. Stomach (should be done to note for any abnormal smell, stains, congestions, mucosal edema, erosions, ulcers and perforations.)

d) Heart should be examined for signs of myocardial infarction, even if the coronary arteries are patent. Some drugs such as Cocaine can cause severe vasospasm and cause death from myocardial infarction and arrhythmias.

e) Lungs should be examined for signs of edema. f. Other organs such as liver should be examined for signs of hepatitis (Enlarged, yellowish liver).

At the end of autopsy, even after the above mentioned findings are present the cause of death cannot be ascertained to a particular poison.

For determining the cause of death as poisoning the poison of toxin should be present in the body in fatal dose.

So, we should collect samples from the body and sent for toxicological analysis.

3.12. Samples to be collected:

Currently in our context following samples are collected for toxicological analysis in case oral ingestion:

i. Stomach with its entire content

ii. Piece of liver (200-300gms)

iii. Half of each kidney

For visceral sample saturated sodium chloride is use as preservatives.

In case of suspected alcohol intoxication and carbon monoxide poisoning, at least 10ml of blood is collected (preserved in sodium fluoride for alcohol analysis and for carbon monoxide poisoning blood sample is sealed with paraffin without any preservatives).

CHAPTER 4

4. AUTOPSY ON THE PUTREFIED DEAD BODIES

Sometimes the Police brings along a dead body which is either unknown or has been hidden after murder and only discovered upon by the spread of decomposing smell from the decaying body.

Any such body which is putrefying or decomposing is to be stored separately from the fresh dead bodies which are routinely stored in the mortuary freezers.

A separate autopsy room is to be nominated for the post mortem examination of the putrefied dead bodies which shall meet all the requirements of the autopsy suite taking into consideration the smell and the decomposing gases being created due to decay of the dead body.

Whilst it may be unpleasant, the autopsy examination of decomposing bodies is a rewarding task that will usually reveal the cause of death when performed with care.

After death, body undergoes a series of putrefactive decomposition changes in a predictable order, unless conditions favoring desiccation/mummification or adipocere formation intervene.

All three decomposition changes may be present in the same body.

Determining the postmortem interval in such bodies is fraught with difficulty.

A systemic approach to the adult autopsy, coupled with an awareness of the limitations imposed by putrefaction on postmortem computed tomography, external examination, dissection findings and ancillary investigations is essential

It is not surprising that many people find decomposing bodies unpleasant.

Distortion of the body's features by a combination of decomposition changes and insect/animal predation render it visually unappealing.

Most decomposing bodies have a strong unpleasant odour.

Skin slippage and the accumulation of greasy putrefactive effusions within body cavities render the body and its organs difficult to handle.

These factors contribute to a belief that autopsying decomposing bodies is an activity of little value, but there is likely to be a strong element of confirmation bias at play.

Figure 1: Body in advanced stages of decomposition

4.1. Decomposition processes

The body begins to break down within minutes after death. Autolysis, or 'self-digestion', occurs due to the action of lysosomal and digestive enzymes and is best exemplified in the pancreas.

The decompositional changes that subsequently take place are complex and depend on the environment in which the body lies. They can be divided into three broad categories: putrefaction, desiccation/mummification and adipocere formation.

All three decompositional processes can occur in the same body. Impact of environment and insect/animal predation

Putrefactive decomposition is commonly associated with insect/animal predation.

Many of the volatile organic compounds released during putrefaction attract necrophagous predators.

A wide variety of invertebrates may feed upon the corpse.

Adult blow flies will typically lay their eggs in orifices, exposed skin creases and wounds and their larvae will produce extensive tissue loss which ultimately can include evisceration of the torso and cranium.

Their actions will tend to accelerate

Which patients are most likely to present in a decomposing state?

To understand which patients are most likely to present to autopsy in a decomposing state, we must consider the factors that predispose to

decomposition.

Putrefaction is accelerated by heat.

Thus, patients with obesity (which provides a layer of insulating adipose tissue to retain body heat for longer after death) or sepsis/fever (resulting in a higher initial body temperature) are more likely to undergo putrefaction, as are those whose bodies were covered by insulating bedding

4.2. Post mortem computed tomography

Post mortem computed tomography (PMCT) has a valuable role to play in autopsy practice.

In the investigation of non-suspicious deaths its use may significantly remove or reduce the need for an invasive autopsy component by revealing the cause of death and/or by targeting dissection to the contents of one or more body cavities.

Gas produced during putrefaction is readily detected by PMCT but this is not of particular benefit at autopsy.

4.3. External Examination

As with all autopsies, the external examination of the decomposing body should be systematic and thorough.

The presence of maggots and other insects should be recorded, and these then can be removed to visualize the underlying tissues.

Difficulty moving and handling the body due to skin slippage and greasy decomposition fluids can be overcome with the aid of cloths or sponges to improve grip on the body.

4.4. Evisceration and dissection

Evisceration of the cadaver is undertaken in the same manner used for other autopsies.

The pathologist must be mindful, however, that putrefactive decomposition may cause artefacts that can be misinterpreted.

As putrefaction enters the bloat stage, gases begin to accumulate within soft tissues and body cavities.

This will impede the determination of the presence or absence of pneumothorax, pneumomediastinum and/or pneumoperitoneum at the time of

death.

4.5. Sample collection

The consideration of which samples to take should form part of the plan made for the autopsy before approaching the body.

There is generally only one opportunity to collect samples for histopathology, toxicology and microbiology and it is better to plan to collect samples for analysis as the autopsy progresses.

It is much easier to discard samples that are not needed than to realize at the end of the dissection that a cause of death has not been identified and that samples are needed after all.

4.6. Conclusions

The odour, appearance and predation of a decomposing body can be unpleasant, but careful systematic autopsies on these bodies are valuable and will frequently reveal a cause of death.

Whilst decomposition progresses through an ordered series of stages, the speed at which this occurs is highly variable.

The autopsy of the decomposing adult body should follow the same standard processes used in other autopsies, but the pathologist must remain mindful that putrefaction and associated insects.

CHAPTER 5

5. SPECIMEN COLLECTION FOR HISTOPATHOLOGICAL EXAMINATION

Mini Autopsy means examination of all viscera (heart, lungs, liver, spleen, kidneys, gastrointestinal tract and brain etc.), along with tissues of special interest (e.g. neck tissues in cases of strangulation, tissues around the bullet tract with tissues from exit and entry wound in gunshot cases, etc.). Mini autopsies constitute a QC and QA procedure for autopsies conducted in 800 autopsy centers of Punjab and elsewhere, where Forensic Histopathology services are not available. Approx. 1/3rd of all Medico legal autopsies are referred for Histopathological examination of the tissues, to reach the final diagnosis as to cause and manner of death, injuries inflicted during life or after death; and to ascertain the role of various contributory factors in the process of death. More than 2500 such cases are referred per year. Major problems encountered in such tissues sent from outside, are briefly mentioned here:

5.1. Poor Fixation

The tissues are fixed in formalin solution, which is formaldehyde gas dissolved in water. With time, its concentration declines gradually, especially if the lid of container is not tightly closed.

If the tissues are sent in formalin which is below 10%, the tissues get autolysed. Therefore, good quality, freshly prepared formalin should be used to fix the tissues.

Fixative has to be added even in Exhumation cases

Every specimen including soft tissues, bones, teeth and fetus etc. should be fixed

If cytological examination of fluids, secretions and blood is required, then add few drops of 10% Formalin in the specimen Brief medical history of the deceased should be clearly mentioned in the forwarding letter.

5.2. Packing of histopathology (tissue) sample

Completely immerse the tissues into 10% formalin solution in a plastic jar having screwed lid.

Quantity of formalin solution should be 3 – 4 times the tissue size.

Tightly close the lid.

Place evidence tape around the lid

Sign the evidence tape at regular intervals so that half part of the signature is on the evidence tape and the other half of the signature is on the container.

Place stamps on the evidence tape in a similar manner. If evidence tape is not available, stamped red wax seals may be used as an alternative.

Place the sealed container/jar in a plastic bag and tie the knot.

5.3. Labeling of samples

Mention following information on the label on sample jars: Name of the deceased

PMR/Case number Sample details

Date and Time of sampling

Collectors name, designation and signature Transportation of samples

Place the sealed jar/s in an appropriately sized card board box and secure the containers in the box.

Mention upper side on the box.

Apply evidence tape at all opening slots of the card board box. Sign and stamp the evidence tape as mentioned above.

Attach chain of custody form with the box.

The sample jars may be transported individually as well. However, make sure that during transportation, they are kept in upright position, so that formalin is not drained out. Otherwise, tissues would get dry and autolysed.

Put postmortem report, all relevant documents such as Report of Death (Report e Marg), FIR/ Application ”Rapat”, MLC, Road Certificate, Concise Case Details (Mukhtasar Halat e Muqadma), and in cases of Exhumation Legible copy of Magistrate or Court Order Relative/Family request along with sample of evidence tape and/or sample of signatures and stamp in an envelope.

Seal the envelope with evidence tape signature and stamp as described above. If evidence tape is not available, stamped red wax seal may be used alternatively, as described above.

Send the histopathology samples and documents to PFSA.

CHAPTER 6

6. SAMPLE COLLECTION FOR TOXICOLOGICAL ANALYSIS

Sample must be submitted in preservative and amount as described below.

For Medico-legal cases (MLCs):

Blood: 10 mL, preserved with sodium fluoride and potassium oxalate, mixed in the ratio 1:3. 20 mg of this mixture is sufficient for preservation of 10 ml of blood.

Urine: 20-50 mL, without any preservative.

Gastric Lavage: Minimum 20 mL, First undiluted portion without preservative.

6.1. For Postmortem cases:

1. Blood: 50-100 mL, preserved with sodium fluoride and potassium oxalate, mixed in the ratio 1:3.

   100-200 mg of this mixture is sufficient for preservation of 50- 100 ml of blood.

2. Urine: Shall be submitted all available without preservative.
3. Stomach contents: Shall be submitted all available without preservatives.
4. Liver: Not more than 100 grams preserved in saturated saline.
5. Spleen: Not more than 100 grams preserved in saturated saline if Carbon monoxide poisoning is suspected.
6. Abdominal paste: Only in exhumation if above mentioned samples are not available (minimum 100 grams shall be submitted), without preservative.
7. Hair: Accepted only in chronic drug exposure (Hair cluster (pulled or collected as near to scalp as possible) having thickness of a pencil shall be submitted).

6.2. Collection, Preservation and Transport of Evidence

Collect toxicology samples as soon as possible after the offense, in death cases before embalming where applicable. Pack specimens in well-sealed, leak-proof containers, all samples must be collected in separate containers. For most specimens, disposable hard plastic or glass tubes are recommended. Blood tubes should be sealed and kept cold, but do not freeze. Never expose specimens to hot temperatures.

6.3. Labeling

For a valid chain of custody, all items of evidence must be labeled with the following information:

i. Name of victim or suspect.

ii. Case number.
iii. Type of specimen (i.e., Blood, Urine).
iv. Site of collection (i.e., Femoral, Heart).
v. Amount of specimen.
vi. Time and date of collection.
vii. Name(s) of the medical examiner or person collecting the sample

Finally, tamper-resistant tape with the collector's initials and the collection date should be placed over the specimen lid and container to document specimen integrity. Alternatively, all the samples collected for a given case may be placed in a tamper evident container labeled with the case number and name.

CHAPTER 7

7. SPECIMEN COLLECTION FOR SEROLOGY AND DNA

7.1. DNA & Serology 1-

7.1.1. Definition

Biological evidence refers to the samples of biological material such as hair, tissue, bones, teeth, blood, semen, or other bodily fluids. Evidence items containing one or more of the aforementioned biological material are also treated as biological evidence.

7.1.2. Objective

The objective of effective collection, packaging and transport of biological material for forensic DNA analysis is to ensure the safety of personnel handling the evidence, preserve the integrity and quality of biological material and avoid its contamination, premature destruction or degradation.

7.2. General Guideline

i. Collection

ii. Packaging

iii. Transport of Biological Evidence

7.3. Biological Evidence Safety and Handling

Individuals handling any evidence should assume that all of it might contain potentially hazardous biological material. It is not possible to determine if every bodily fluid or stain collected from crime scenes is contaminated with blood borne pathogens; therefore, all bodily fluids and tissues are presumed to be contaminated. Common diseases/viruses caused by exposure to blood borne pathogens include hepatitis and human immunodeficiency virus (HIV). These raise the most concern because of the potential for lifelong infection and the risk of death associated with infection once an individual is exposed.

The appropriate use of personal protective equipment (PPE) is recommended to protect the individual and the evidence from cross-contamination. PPE includes disposable gloves, disposable overalls, laboratory coats, masks, and eye protection. PPE should be used in every situation in which there is a possibility of exposure to blood or infectious diseases. Gloves and protective clothing should be worn when conducting medico legal examination, autopsy or collection of biological evidence, handling soiled materials or equipment, and cleaning up spills of biologically hazardous materials. Face protectors, such as splash goggles, should be worn to protect against items that may splash, splatter, or spray.

PPE must be clean and in good repair. PPE that is torn or punctured, or that has lost its ability to function as an effective barrier, should not be used. Disposable PPE should not be reused under any circumstances. While using PPE, individuals should not touch their eyes or nose with gloves.

PPE must be removed when it becomes contaminated and before leaving the work area. Used protective clothing and equipment must be placed in designated areas for storage, decontamination, and disposal.

Dried blood or other dry potentially infectious material should not be assumed to be safe. PPE should be used when handling these items.

When wet material is spilled, the area containing blood or other potentially infectious material should be covered with paper towels or rags, covered with a disinfectant solution (10 % bleach solution), left for at least 10 minutes, and removed. Materials should then be placed in a waste disposal bag designated for biohazardous material. Appropriate PPE should be used throughout this process.

Biological evidence packages must be appropriately labeled to indicate that they contain biological material, which may potentially be infectious so that other individuals could avoid the risk of exposure or contamination of the evidence.

Any accidental direct exposure to the biological evidence must immediately be reported to an appropriate healthcare provider.

7.4. Packaging of Biological Evidence

Use paper bags, manila envelopes, cardboard boxes, and similar porous materials for the packaging of all biological evidence.

Do not use glass bottles, plastic jars, metal containers, polythene bags or other such like non porous materials for the packaging of biological evidence. Bacterial growth or mold can irreversibly damage and degrade the biological material in such like packaging.

Package evidence and seal the container to protect it from loss, cross-transfer, contamination, and/or deleterious change.

For security purposes, seal the package in such a manner that opening it causes obvious damage or alteration to the container or its seal.

Evidence tape or clear scotch tape may be used to seal evidence. Mark across the seal with the sealer’s identification or initials and the date. Signature of the sealer should be inscribed on the seal such that half of the

signature is on the tape and the other half is on the envelope or container.

Package each item separately and avoid comingling items to prevent cross-contamination.

Each evidence item packaging must be labeled bold and clear to indicate BIOLOGICAL EVIDENCE.

At a minimum, mark each package with a unique identifier, the identification of the person who collected it, and the date of collection. The unique identifier should correspond to the item description noted on the PMR or MLC, police docket or doctor's request for test and the road certificate. Packaging should also be labeled to indicate the unique identity of the evidence within. For example, the name of patient, FIR Number, MLC Number or PMR Number must be clearly labeled on the packaging.

DNA is best preserved in an air-dried, water-free environment. Water can cause instability and breakage in strands that bind DNA, which would degrade the ability to properly test. Further, the presence of water encourages the growth of yeast, mold, and bacteria, which can also degrade DNA. Therefore all biological evidence samples must be in dry form prior to packaging, temporary storage or transport. Drying wet items of evidence, such as swabs or a blood-soaked or mud-stained garment, should be the first task of anyone handling wet biological evidence once it has been collected.

Blood-draw samples or tissue samples may however be packaged and transported without drying. If drying wet evidence is not possible, place the evidence in an impermeable, nonporous container and place the container in an ice box or refrigerator that maintains a temperature of 2 °C – 8 °C and that is located away from direct sunlight until the evidence can be submitted to the laboratory.

Unload, make safe, and place all firearms submitted into evidence for biological testing into a new cardboard gun box. As the submitting individual, seal the box and indicate on the exterior of the box that the weapon was unloaded, made safe, and may contain biological material.

Sharp weapons such as knives, daggers, showels etc. should be packaged in appropriate sized cardboard box or carton. As the submitting individual, seal the box and indicate on the exterior of the box that it contains SHARP weapon and may contain biological material.

Maintain the integrity of the item through the package documentation, including all markings, seals, tags, and labels used by all of the involved agencies. Preserve and document all packaging and labels received by or returned to the agency, because this information is critical.

Guideline for the Collection, Packaging and Transport of Evidence in Sexual Assault Cases

PFSA Sexual Assault Evidence Collection Kits (SAECK) are designed for the effective collection of evidence from the victims of sexual assault. PFSA SAECKs must always be used for the collection and packaging of evidence in rape cases. The PFSA SAECK contains sterile swab sticks, distilled water and comb for the collection of evidence; a pair of sterile gloves to be used while collecting and handling biological material for the safety of evidence collector and prevention of samples from contamination; paper envelopes of various sizes for the packaging of evidence and tamper proof tape for appropriate sealing of evidence for submission.

Victim's underwear and garments worn at the time of assault should be collected and packaged in the envelope provided in the sexual assault evidence kit.

Evidence should be collected after a thorough evaluation of the assault and background history is obtained, if possible. Documentation typically referred to as medico legal examination report or certificate (MLC) should contain specific information about the assault, what items were collected during the exam, and personal information from the victim.

Prior to collection of evidentiary items, medico legal examiners must consider several factors to assist in guiding their collection and treatment efforts. These factors may include the assault activity, time elapsed since the assault, post assault activities, the age and gender of the assault victim, and mental capacity, to name a few. History written in the MLC should incorporate descriptive notes on the aforementioned factors.

Evidence collection should be guided by the background history, focusing specifically on the suspect's actions during the assault. However if the victim is unable to recollect a complete background history due to trauma or pre-existing mental in capacity, a full range of samples should be collected assisted by the physical assessment.

Additional considerations prior to sample collection must include the activities of the victim following the assault. Activities that may impact evidence collection include bathing, brushing of teeth, mouthwash, vomiting, douching, urination and defecation. Careful consideration of the assault activities and post assault activities prior to sample collection is vital. For example, the analysis of swabs collected by swabbing from areas that are kissed, licked, sucked or bit may be impacted if the victim has showered or bathed between the assault and the time of collection. The victim should therefore be carefully interviewed to record appropriate observations about these post assault

activities and findings should be documented on the MLC.

Internal swabs such as from the vagina, mouth or rectum may still be viable for collection even after showering or bathing by the victim, dependent upon the length and thoroughness of the cleansing and time since the assault. Internal and external swabs should still be collected even if the victim has bathed, as the bathing may not have been vigorous enough to remove the fluids or DNA from the victim.

Potential biological evidence deposited onto a substrate such as clothing, towels, paper towels or tissue papers do not have the same time restrictions as biological evidence deposited on, or within, the victim's body. Therefore, garments and wipes etc. must always be collected and submitted for DNA analysis regardless of the time elapsed since sexual assault.

Evidential items are collected with the perspective of recovering as much DNA foreign to the victim as possible during the collection process. Measures should therefore be taken to concentrate the foreign material by using the fewest number of swabs necessary for the collection site.

If multiple swabs are used during the collection, they should be collected concurrently.

If swabs are not taken concurrently, then the order of the swabs collected must be noted, appropriately labeled on the swab packaging and documented. When more than one swab is collected from an area then these swabs should also be collected in a consistent fashion. For example if one moistened swab was used for evidence collection, then the second swab should also be moistened.

Only sterile standard cotton tip swabs, provided in PFSA SAECK or otherwise commercially available, can be used for collection of evidence from the body of victim. Homemade swabs and cotton balls etc. should never be used for evidence collection.

Swabs should always be properly air dried prior to packaging. Swabs should never be packed in any liquid or preservative.

Garments, if blood stained or wet, should be dried prior to packaging.

Semen has a limited post-coital DNA persistence time to reside on the surface of the body and within a body tract. The maximum recommended time frames for evidence collection in the cases of sexual assault are as under:

Type of Assault	Maximum Post Coital Time Duration for Evidence Collection
Vaginal	Up to 120 hours (5 days)
Anal	Up to 72 hours (3 days)
.Oral	Up to 24 hours (1 day)
Bite marks	Up to 96 hours (4 days)

Alleged assaults that may have resulted in deposition of semen externally (victim's clothing, bedding, etc.) should also result in evidence collection because semen will remain indefinitely on these items as long as they are unwashed.

Guideline for the Collection, Packaging and Transport of Biological Evidence in Dead Body Identification Cases

Sample Submission Form for Dead Body Identification through DNA Profiling

7.5. Reference Samples

Buccal swab are collected at PFSA Lahore as standard reference for DNA profiling, in accordance with the ERU SOPs.

CHAPTER 8

8. SPECIMEN COLLECTION FOR METALLIC PIECES AND GUNSHOT RESIDUE

8.1. Gunshot Primer Residue

8.1.1. Sample Required:

Pure carbon adhesive stubs dabbed from both hands of the shooter preferably one stubs from each hand including back and palms in a sealed and labeled parcel.

No cotton swabs or hand washes from the hands of the shooter are accepted.

At least 2 Adhesive carbon stubs dabbed from (1: right hand & Palm, 2: left hand back & palm)

GSR sampling must be done within 4- 6 hours of shooting. After that, GSR sample may not be present for detection and identification.

HAND WASH is not suitable for GUNSHOT PRIMER RESIDUE analysis.

Every cartridge case and bullet must be packaged separately. Evidence submitted for Gun Shot Residue (GSR) analysis must be packaged in hard box instead of cloth bag or paper envelope. Layers of the clothes containing GSR must not touch with the other layers. Clothes must be wrapped by placing a white paper sheet between the layers of clothes before packing it in a hard box.

CHAPTER 9

9. EXHUMATION

Exhumation is done for number of reason and includes establishment of identity, to know cause and manner of death, belated suspicion of an unnatural death or for medical insurance problems.

Compared with conventional autopsy done immediately after death, exhumation poses many problems.

Exhumation stands as a very significant feature of forensic investigations.

The legal excavation of dead bodies for ascertainment of the cause of death has always aided the law enforcement agencies to comprehend the anonymity of any suspicious case and further convict the criminal in cases of homicides.

Exhumation or disinterment is the procedure of excavating the remains of previously cremated or buried individuals for medico-legal investigations, relocation or other purposes.

Exhumation is an expensive, prolonged process and requires official permission from the legal authorities.

Hence, it is practiced only when a certain need arises. Exhumation requires strict and vigilant procedures into enactment.

First, the acquisition of legal permission for the procedure is required in the form of the authorization from the District and Session Judge/Additional District and Session Judge/Judicial

Magistrate under the Section 176 of the Criminal Procedure Code (CrPC).

An important incentive of exhumation is the request by the relative of the deceased, to ascertain the cause of the death.

Cases often include those where no autopsy was performed before burial, and further investigations later lead to exhumation. Exhumation may also be performed solely for the identification of missing or abducted individuals.

Much of its significance lies in identification of individuals buried en masse.

Exhumation has proven to be extremely worthwhile in scenarios like those following war in Serbia, Croatia and Yugoslavia where war victims were tortured, maimed and buried in mass burial grounds.

Thus, exhumation proved to be gratifying for the relatives, leading to the identification of the missing individuals. Geneva Convention of 1949 reserves the right of the relatives to “know the fate of their deceased relatives.

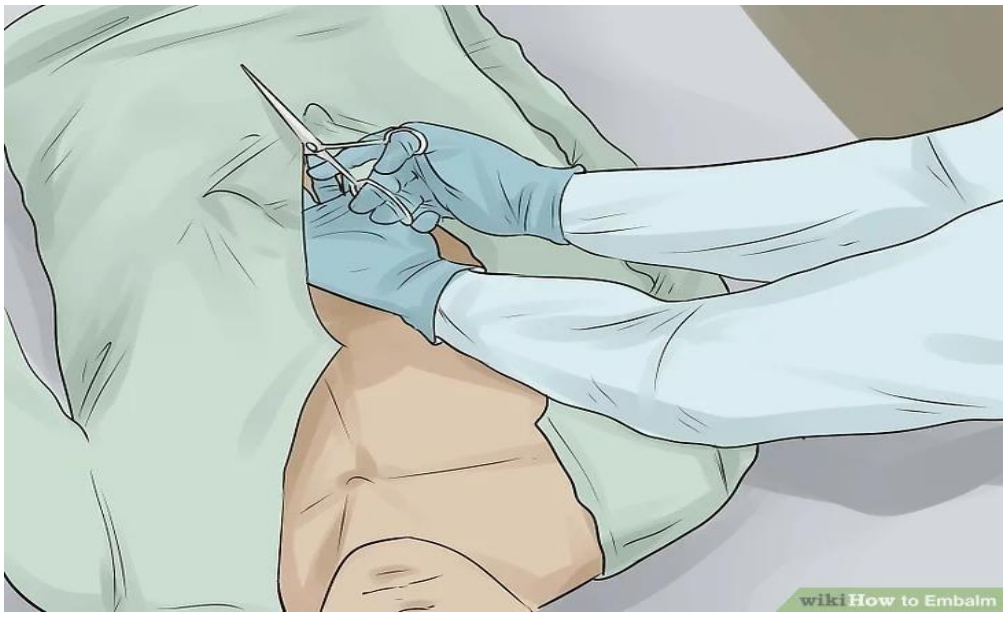
CHAPTER 10

10. EMBALMING TECHNIQUES

10.1. Preparing the Body

Make sure the body is face up.

If the body is front-side down, gravity will pull the blood down to the lowest parts of the body, particularly the face. This can discolor and bloat the facial features, making it more difficult to create a life-like appearance for the viewing.



Remove any clothing that the person is wearing. You will need to see the skin for signs that embalming is working, so the body will remain uncovered

throughout the procedure. Also remove any IV needles or catheters that are in place.

Typically, you'll need to catalog any property found on the person, as well as any cuts, bruises, or other discolorations at this time on your embalming report. This will also be used to document the procedure and chemicals used in the process. The report acts as insurance if the family chooses to sue the funeral home for any reason.

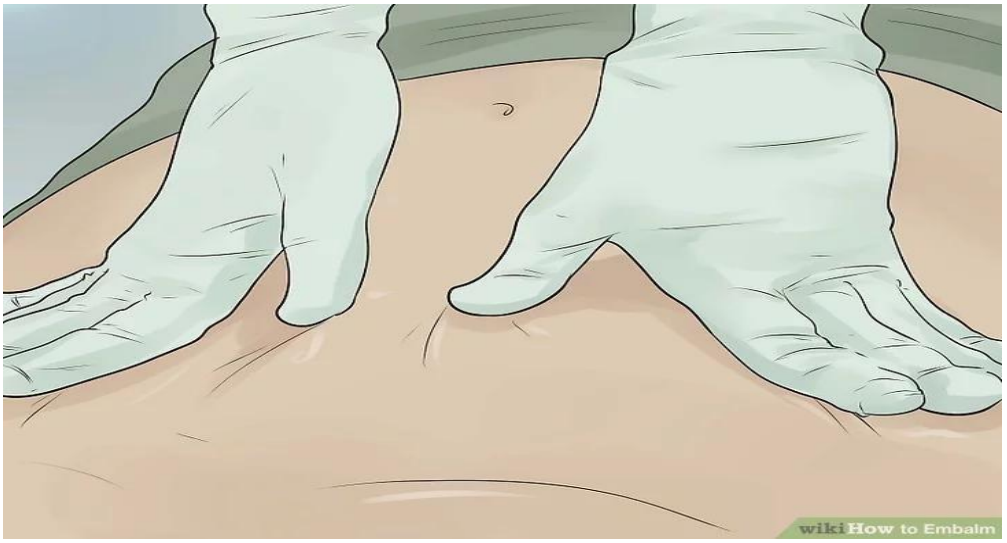
Respect the body at all times. Use a sheet or towel to cover the genitals, and don't leave tools laying around on it while you're working. Assume the family may pop in at any moment.

Disinfect the mouth, eyes, nose, and other body openings. Wash the entire body with a germicidal soap or detergent.

Spray a powerful disinfectant to clean bodily openings, open wounds, and other necessary surfaces.

Inspect the deceased in regards to the type of fluid you will need. Some embalmers will use this opportunity to mix all the fluid they'll need for the procedure to get it ready. Usually, 16 ounces of fluid with 2 gallons (7.6 L) of water is a good dilution.

Shave the body. Typically, the face and body are shaved at this point.
Men, women, and children are shaved to improve the look of the makeup.



However, if the person had facial hair, the hair stays.

Relieve rgor mortis by massaging the body. Massage the major muscle groups to relieve the tension and move stiff joints to loosen them up. Even though rigor mortis goes away naturally, massaging the body helps to postpone it or move the process along.

10.2. Setting the Features

Close the eyes. Use great care in setting the eyes. Place an eye cap on each eye to set the eyelids in place.

Eyelids are never sewn shut but may be glued shut in some cases.

The features need to be set before the embalming fluid is introduced, because that fluid will "set" the body fairly rigidly, making it difficult to do it afterward.

Close the mouth and set it naturally. One of two methods is typically used to set the mouth:

Sometimes, the mouth is sewn shut using mandible suture. Pass a curved needle through the jaw under the gums and back up through the septum. Place dentures, a mouth former, or cotton inside to help shape the mouth. Tie the string into a bow.

A needle injector is also commonly used in conjunction with a mouth form. Like a mouth guard or a dental prosthetic, the mouth form holds the jaw together to create a natural bite and alignment of the jaw.

This method often includes less room for human error.

Moisturize the features. Apply a small amount of massage cream to the face and hands to keep the skin soft and pliable.

10.3. Embalming the Arteries

Find the carotid or femoral artery. The arteries are embalmed by simultaneously introducing embalming fluid (a mixture of formaldehyde, other chemicals, and water) into the carotid or femoral artery while draining the blood from a nearby vein or from the heart. It takes about two gallons of fluid to embalm a typical body.

Make your incision. Clean the vein point off, create an entrance point, and insert the drain tube towards the heart. Tie a ligature around the lower side of

the tube.

Do the same for the artery except insert the cannula instead of a drain tube. Place the cannula forceps on the artery locking the cannula in place. Use the small locking forceps to clamp off the upper side of the artery and restrict the flow.

Turn on your embalming machine and distribute the fluid. While the embalming is taking place, wash the body with a good germicidal or antibacterial soap and be sure to check for drainage while massaging the limbs to push blood out and embalming solution in.

When the fluid enters the arteries, pressure will build throughout the veins, which means the fluid is moving throughout the body. You'll notice the veins bulging somewhat. Open the jugular drain tube periodically to allow blood to escape and relieve the pressure.

Slowly decrease the pressure. Once the area is thoroughly embalmed, turn off the machine and reverse your arterial tube to the other side of the artery

you chose to inject.

This will embalm the part that was blocked by the arterial tube previously. Be sure to turn down the pressure, as the fluid only has to go a short distance.

In the case of the femoral, this will embalm the lower leg. In the case of the right common carotid, this will embalm the right side of the head.

Finish. When you've embalmed to your satisfaction, or run out of fluid, turn off the machine, remove the cannula, and tie off the veins and arteries you used. Suture the incisions closed. Use sealing powder or putty to ensure there is no leakage.

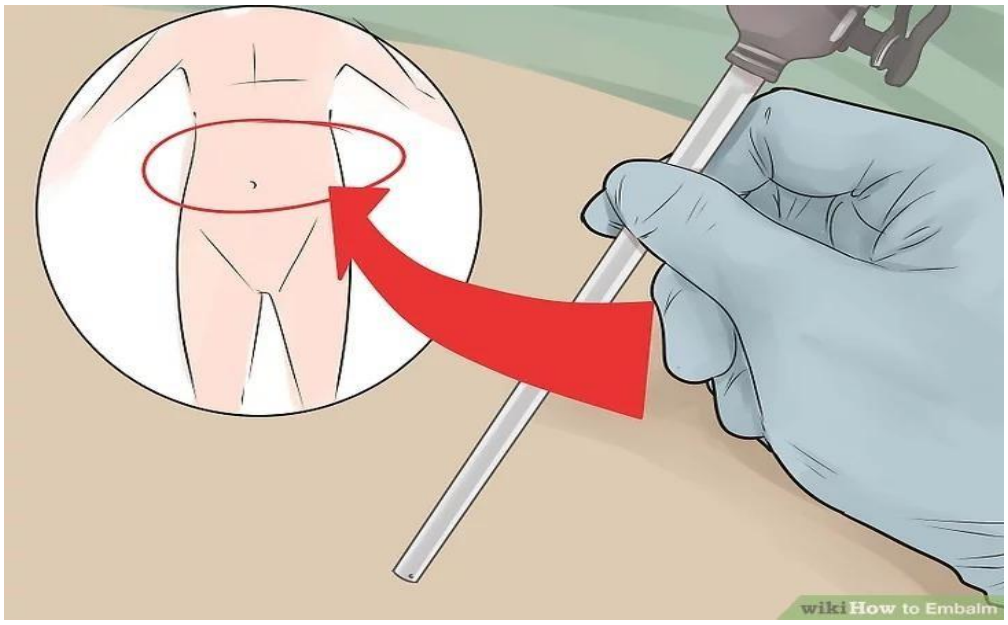
10.4. Embalming the Cavity

Use a trocar to aspirate the organs. Now that the arteries have been embalmed, you need to suction any liquids or gasses inside the organs in a

process called aspiration.

Aspirate the chest cavity. Insert the trocar 2 inches (5.1 cm) to the right and 2 inches (5.1 cm) superior to the umbilicus (belly button).[20] Clean out the hollow organs in the abdomen such as the stomach, pancreas, and small

intestine.



Aspirate the lower cavity. Remove the trocar, turn it around, and insert it into the lower body, aspirating the contents of the large intestine, bladder, and in the case of females, the uterus. The anus and vagina are sometimes packed with cotton to avoid seepage.

Inject cavity fluid into the torso. Attach a 16 ounce bottle of cavity fluid to the other end of the bottle injector. The gravity injection method is typically used

to push the cavity fluid into the hollow organs, sterilizing and preserving them.

Make sure you get both the upper and lower organs. This step is crucial in preventing "purge."

Remove the trocar and close the hole with a trocar screw. Clean out your trocar and put it away.

10.5. Casketing the Body

Wash the body thoroughly. Using the same disinfectant used earlier, clean the body thoroughly to remove any blood or other chemicals left behind by the embalming process.

Use delicacy and care in this process.

Touch up the features. Lifelike makeup will be applied to the face and hands, the fingernails will be clipped, and the hair should be styled and groomed.

Dress the body. Generally, the deceased's family will choose the clothes to be worn in the casket. Dress the body carefully and appropriately.

Sometimes plastic underwear is used to protect especially leaky bodies.

Place the body in the casket. Arrange the body peacefully. Consult the family for any advice or further instructions regarding the presentation.

CHAPTER 11

11. RESTORATIVE ART

Reconstructive procedure to establish a natural cosmetic look in cases of accidental deaths as well as victims of blast scenario.

This restorative technique is also helpful in establishing identity of the unknown suicide bomber.

Restorative procedures begin with the embalming process and may become more in depth dependent upon the circumstances surrounding the death of an individual.

Restoration needs can vary from discoloration and slight defects to the need of post mortem reconstructive surgery, including facial restoration, if one has died from an accident, certain illnesses and other tragic circumstances resulting in severe trauma and disfigurement of their body and features.

What are Restorative Arts and Reconstructive Surgery? Following a natural death, restorative measures beyond the embalming process often times are not necessary.

However, when a death occurs resulting in severe trauma or disfiguration from an accident or other tragic circumstance, more extensive procedures may need to be carried out in order to achieve the level of “acceptability” and an identifiable state for the family.

A variety of fatal incidents can lead to disfiguration that may need restoring.

Often times a family may be given misleading information by investigating officials and other personnel that their loved one is not viewable.

Generally, these personnel are not qualified to make the determination whether an individual can be reconstructed and restored for viewing purposes, and they may not be fully aware that a qualified embalmer may be able to restore that individual to a viewable, identifiable and acceptable state.

In case of the remains of a suicide bomber, various body parts may be recovered which might include

i. Head
ii. Torso
iii. Upper limbs
iv. Lower limbs

APPENDIX

PUNJAB FORENSIC SCIENCE AGENCY (PATHOLOGY UNIT)

PPM/WS/L4/016	Forensic Pathology Analysis Request Form	Issue on	29-07-2020	Revision	2.1

Victim/Deceased Name	
Father's Name	
Husband's Name (if applicable)	
Date of Death	
PMR / Exhumation / MLC	No. Date:
Brief Case History	

SPECIMEN TYPE: ☐ **PMR** ☐ **Exhumation** ☐ **MLC**

CASE TYPE:

☐ Unnatural / Suspicious Death
☐ Hanging/Strangulation/Throttling/Smothering
☐ Drowning
☐ Poisoning
☐ Burn/Electric Shock
☐ Death in Hospital
☐ Fetus (Age/Sex/Still or Live Birth)
☐ Pregnancy/Abortion
(Swabs if submitted must be fixed in Alcohol)
☐ **Torture**
☐ Trauma (Specify: _____)
☐ **Other** (Specify: _____)

ORGAN(S) DETAIL (SUBMITTED FOR HISTOPATHOLOGY/CYTOLOGY):
ALL TISSUES FOR HISTOPATHOLOGY MUST BE SUBMITTED IN 10% FORMALIN SOLUTION

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Any Other: _____

Hospital Name & Address			
MLO/ Autopsy Doctor	Name:	Sign & Stamp	Date:
Contact Detail:	Phone:	Email:	

Read the contents of this form carefully before submitting.

THIS FORM MUST BE FILLED PROPERLY BY MLO AND SHALL BE SUBMITTED ALONG WITH SPECIMEN(S), OTHERWISE SAMPLE(S) WILL NOT BE ACCEPTED.

Victim/ Deceased Name	
S/O, D/O, W/O	
Date & Time of Incident	
Hospital Admission Detail(s)	Date: Time:
Victim Expiration Detail(s)	Date: Time:
MLC/PMR # & Date	
Medication History	**Attach prescription (if needed)**
Any Unusual PMR/MLC Findings	

SAMPLE MUST BE SUBMITTED IN PRESERVATIVE AS DESCRIBED BELOW. IF IT IS NOTED THE PRESERVATIVE IS NOT THE SAME AS BELOW, SAMPLE WILL NOT BE PROCESSED FOR ANALYSIS

MLC Specimen	☐ Blood	10 mL preserved with sodium fluoride and potassium oxalate, mixed in the ratio 1:3. 200 mg of this mixture is sufficient for preservation of 10 ml of blood.
	☐ Urine	20-50 mL **without preservatives**
	☐ Gastric lavage	First undiluted portion (minimum 20 mL) of gastric lavage shall be sent, **without preservative.**

PMR Specimen	☐ Blood	50-100 mL preserved with sodium fluoride and potassium oxalate, mixed in the ratio 1:3. 200 mg of this mixture is sufficient for preservation of 10 ml of blood.
	☐ Urine	Shall be submitted all available **without preservatives**
	☐ Stomach contents	Shall be submitted all available **without preservatives**
	☐ Liver	Not more than 100 grams preserved in saturated saline
	☐ Spleen	Not more than 100 grams preserved in saturated saline if Carbon monoxide poisoning is suspected
	☐ Abdominal paste	Only in exhumation if above mentioned samples are not available (maximum) 100 grams shall be submitted), **without preservative.**
	☐ Hair	Accepted only in chronic drug exposure (Hair cluster (pulled or collected as near to scalp as possible) having thickness of a pencil shall be submitted)
	☐ Vitreous humor	Submit all available vitreous humor (preserved with 10 mg Sodium fluoride) from each eye for Postmortem alcohol analysis

Case Type	**Test Requested On The Basis of PMR/MLC Findings and case type**
Alcohol Ingestion	☐ Ethanol ☐ Other Volatiles
Strangulation/Blunt or Sharp Means/ Firearms/Drowning/Diseased/Electric shock	☐ Sedatives ☐ Drugs Screening
Burning/Suffocation	☐ Sedatives ☐ Carbon Monoxide
Road accident/Drug Facilitated Crimes	☐ Alcohol ☐ Sedatives
Poisoning (Known/Unknown)	☐ Black Stone ☐ Phosphides ☐ Drugs Screening ☐ Pesticides ☐ Cyanide ☐ Any Other Test (specify)____

Any other History (If Applicable): **Attach a separate page if needed**

Requesting Agency	**Hospital Name & Address**			
MLO Detail	Name	Signature	Stamp	Date
Contact Detail(s)	Phone Number	Email		

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