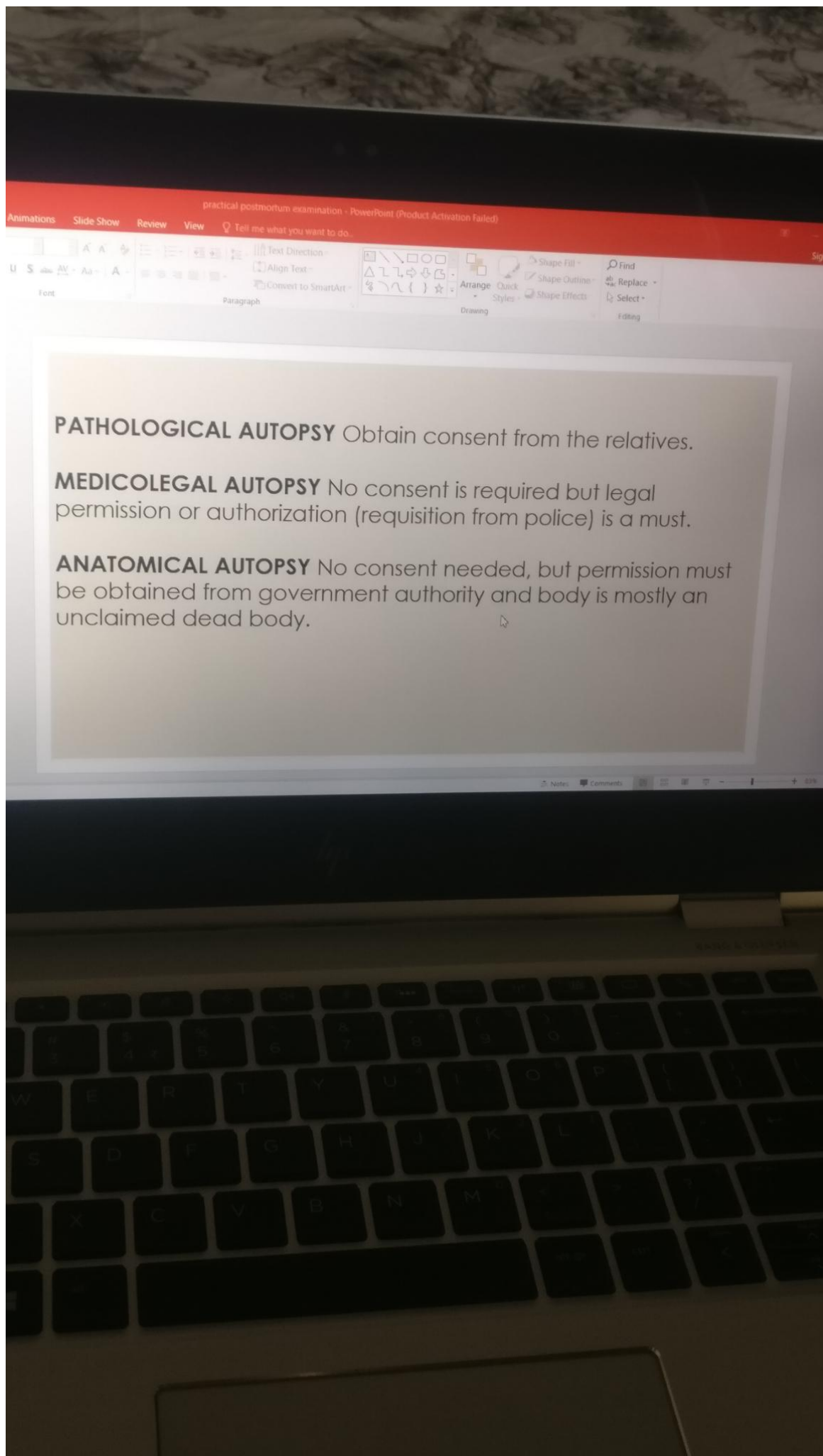
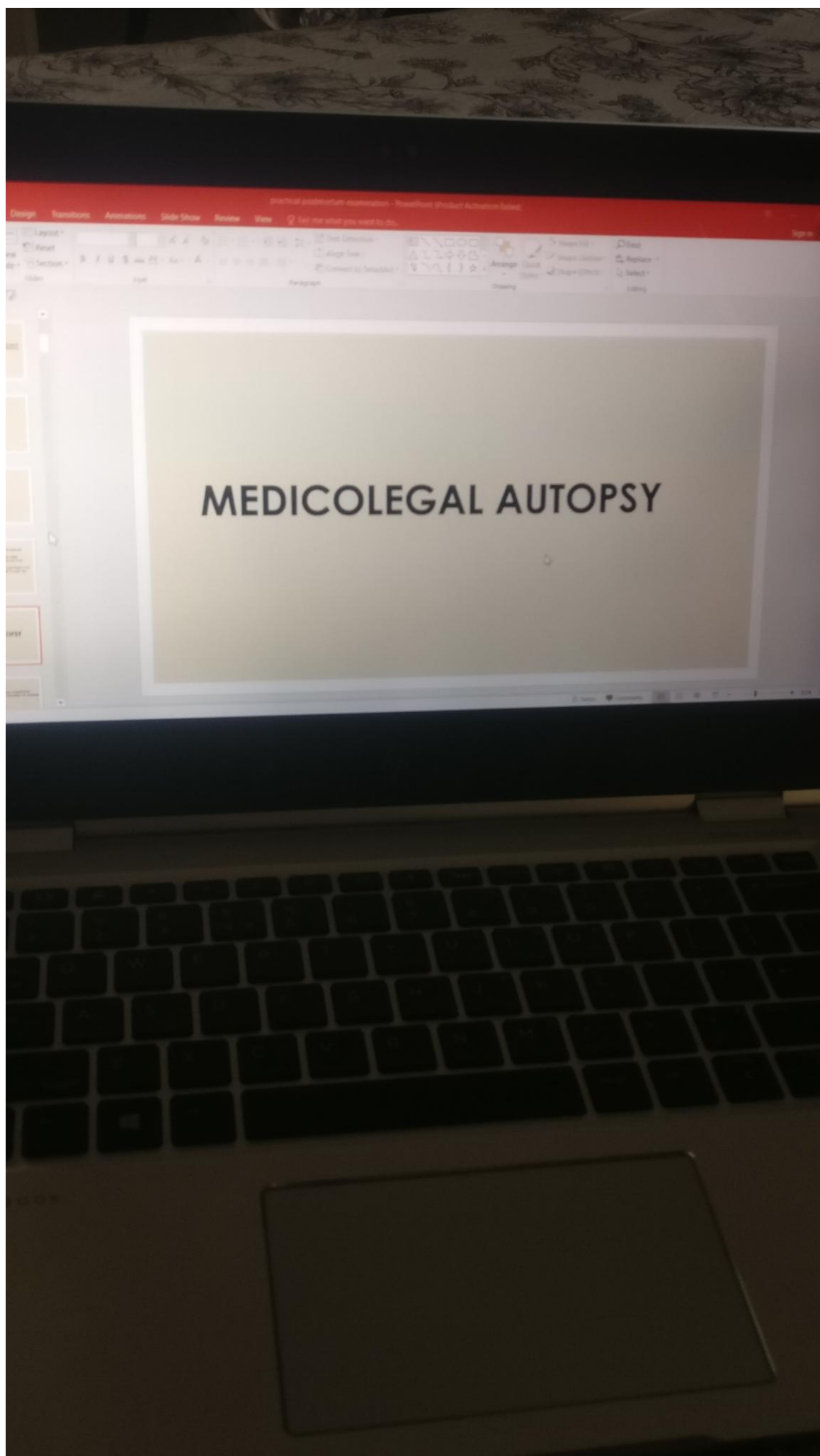
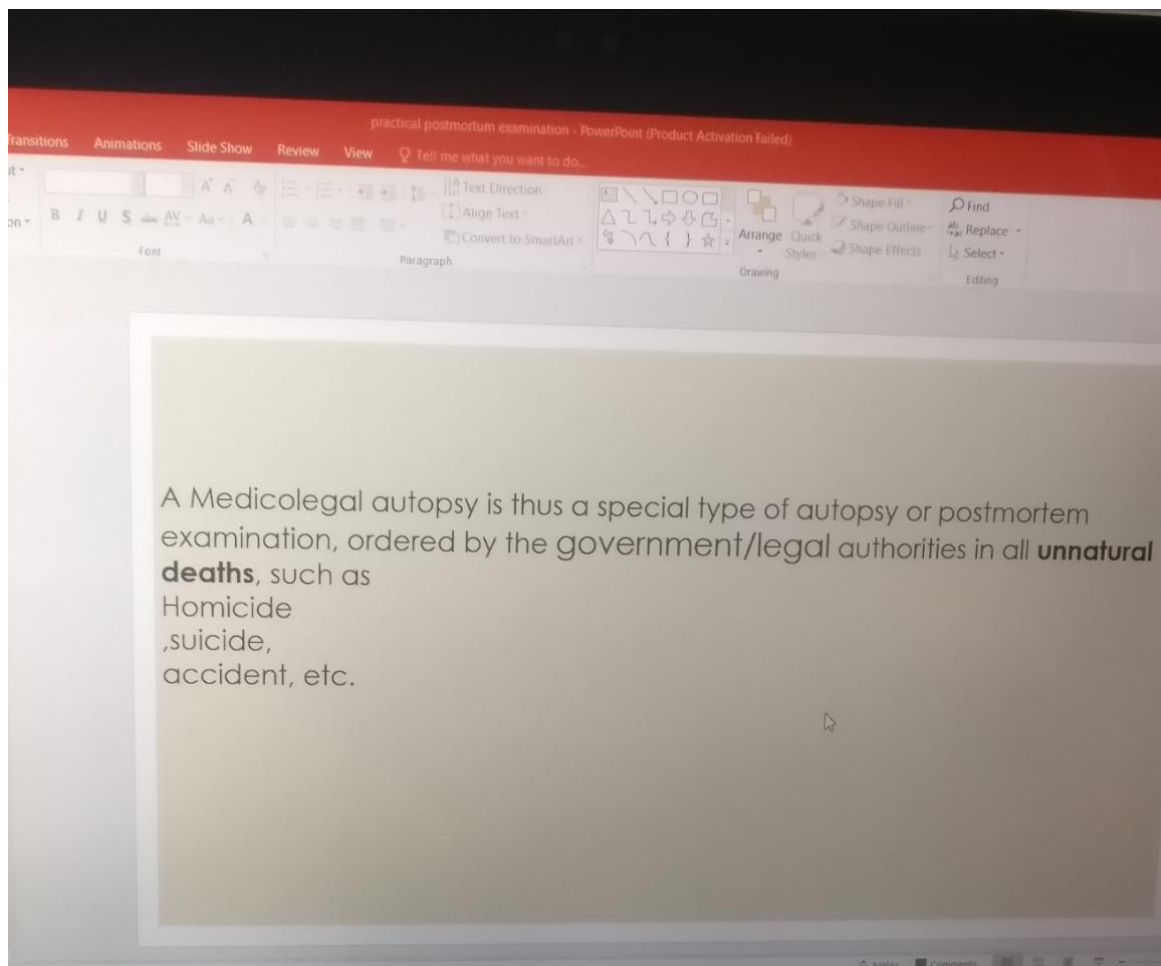


Anatomical autopsy

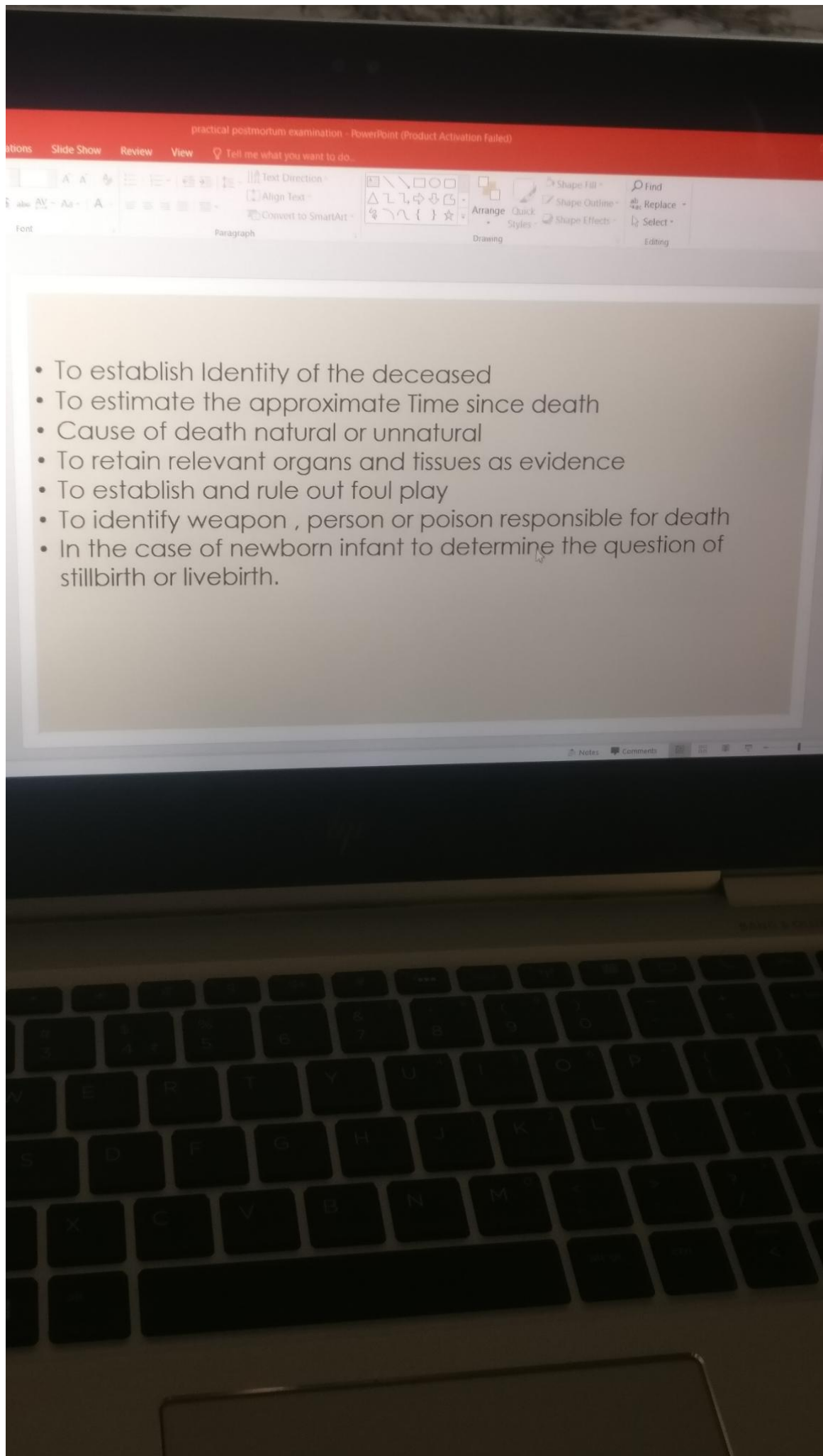
- Unclaimed dead bodies
- Anatomist
- Normal structure



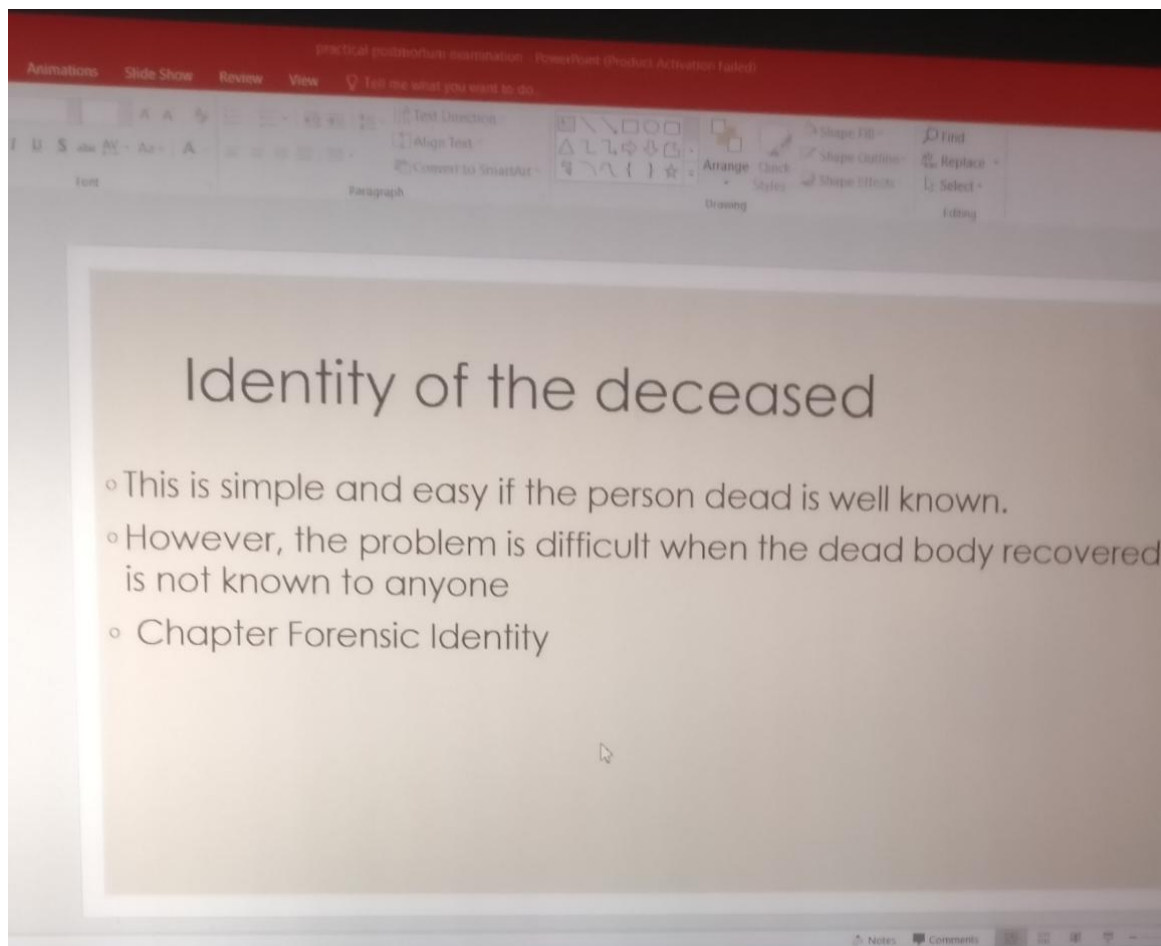




A Medicolegal autopsy is thus a special type of autopsy or postmortem examination, ordered by the government/legal authorities in all **unnatural deaths**, such as Homicide, suicide, accident, etc.

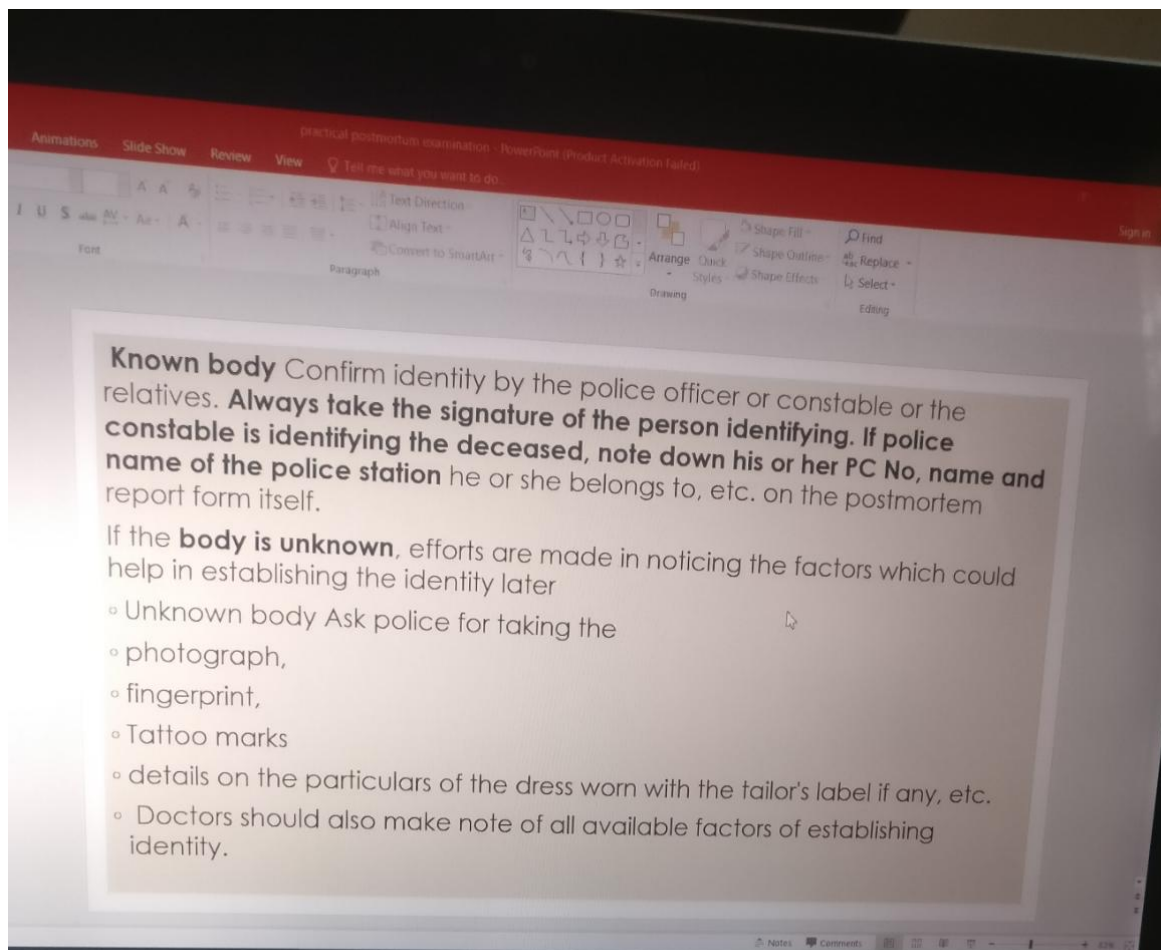


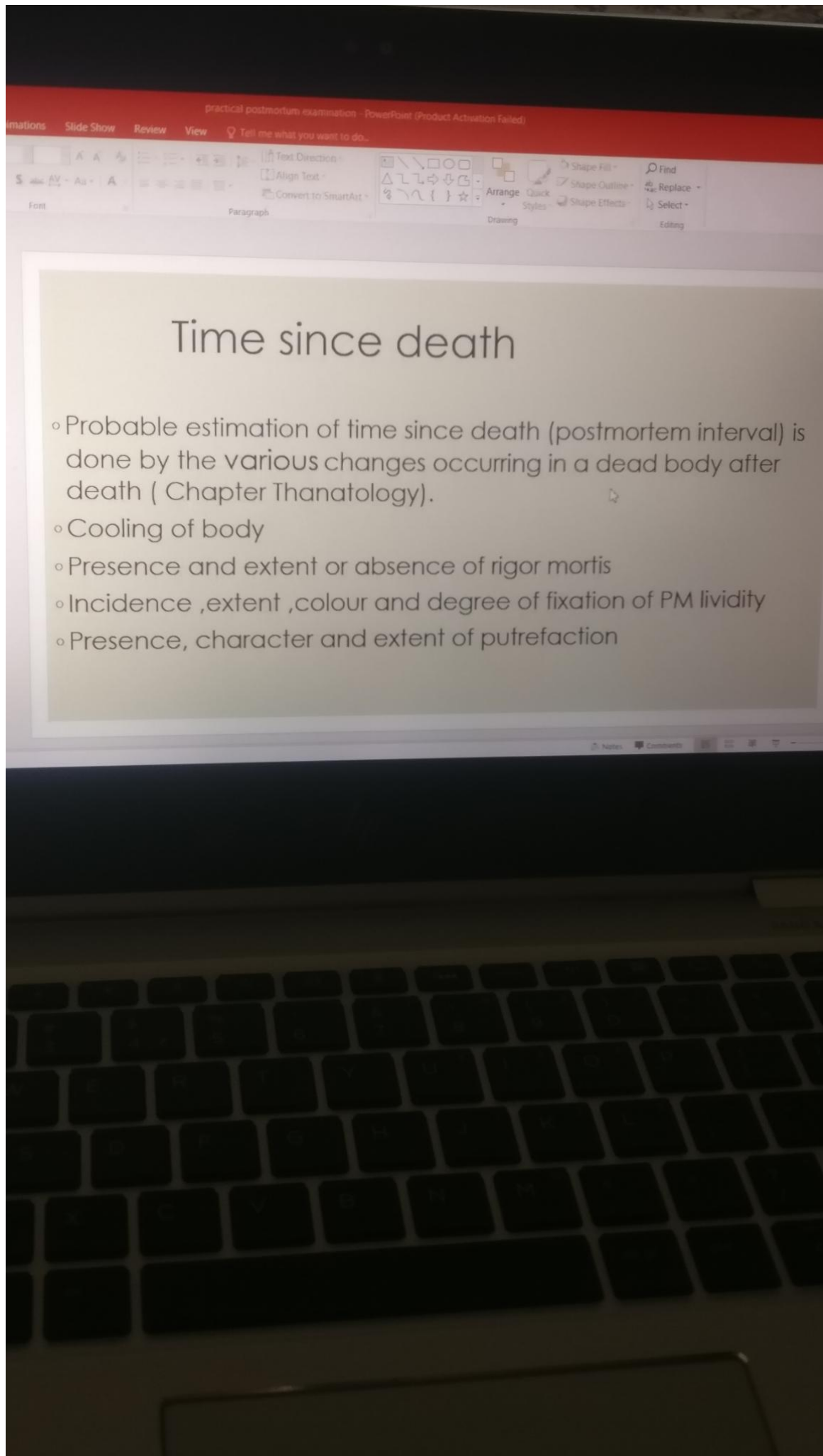
- To establish Identity of the deceased
- To estimate the approximate Time since death
- Cause of death natural or unnatural
- To retain relevant organs and tissues as evidence
- To establish and rule out foul play
- To identify weapon , person or poison responsible for death
- In the case of newborn infant to determine the question of stillbirth or livebirth.



Identity of the deceased

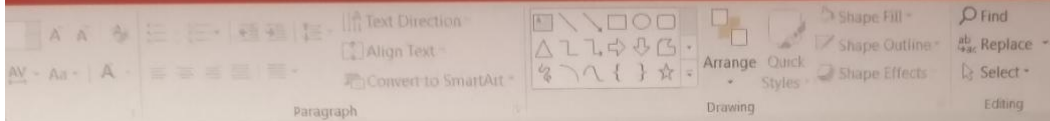
- This is simple and easy if the person dead is well known.
- However, the problem is difficult when the dead body recovered is not known to anyone
- Chapter Forensic Identity





Time since death

- Probable estimation of time since death (postmortem interval) is done by the various changes occurring in a dead body after death (Chapter Thanatology).
- Cooling of body
- Presence and extent or absence of rigor mortis
- Incidence ,extent ,colour and degree of fixation of PM lividity
- Presence, character and extent of putrefaction



Time Since Death & Body Condition

Time Since Death

Less than 1 hr

3 hrs

6-8 hrs

12 hrs

24-36 hrs

48 hrs

Body Condition

Body warm

Patchy post-mortem lividity

Lividity fully developed & fix

- Rigor present all over

- Green patches over Caecum

- Body cold and rigor recedes

- Ova of flies seen

- Green discolouration – adbo, chest

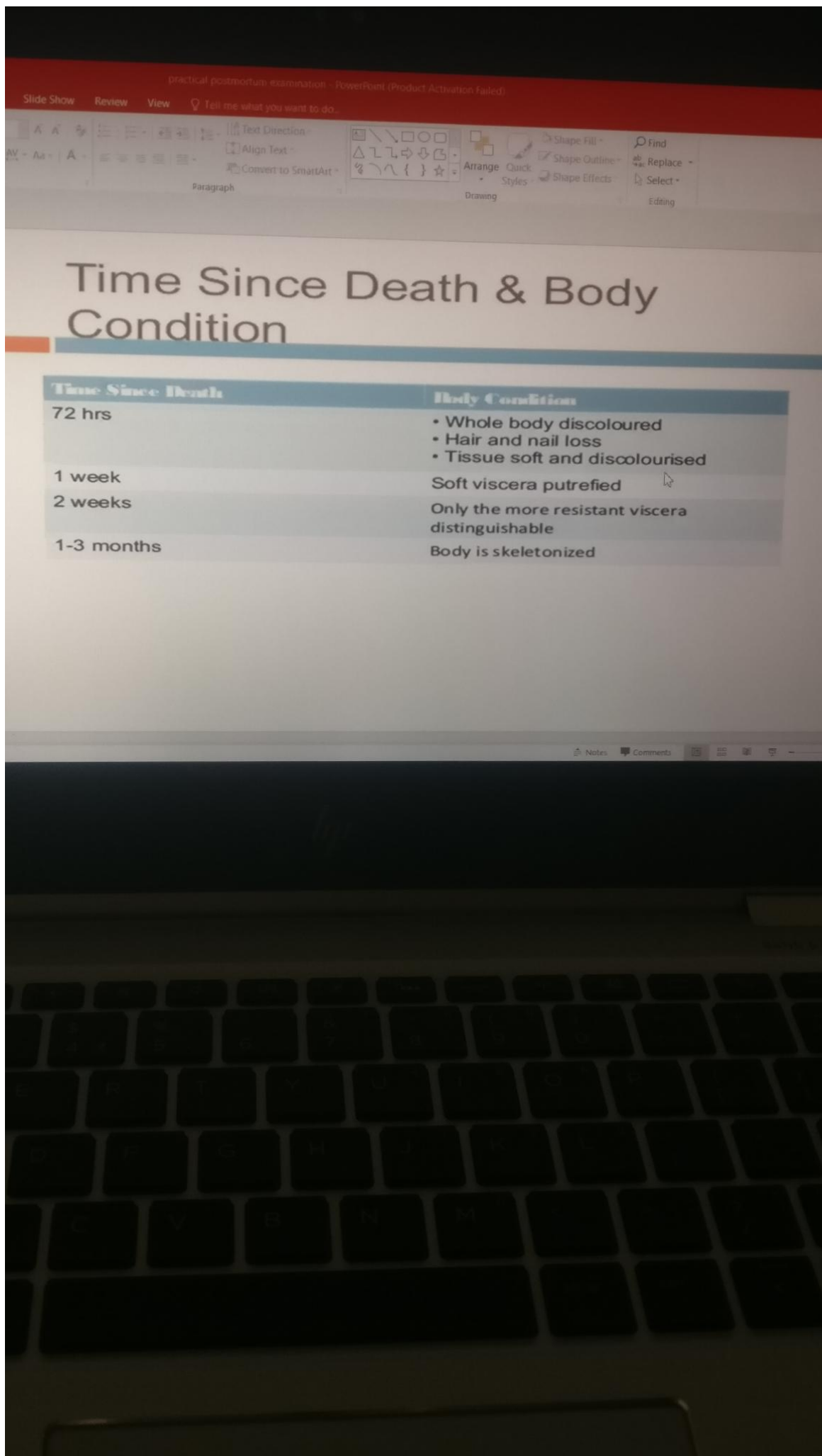
- Abdo distend with gas

- Trunk bloated

- Face decolouration

- Swollen blister present

- Moving maggots seen



Time Since Death & Body Condition

Time Since Death	Body Condition
72 hrs	<ul style="list-style-type: none">• Whole body discoloured• Hair and nail loss• Tissue soft and discoloured
1 week	Soft viscera putrefied
2 weeks	Only the more resistant viscera distinguishable
1-3 months	Body is skeletonized

LEGAL FORMALITIES

- Legal formalities in taking up a case for Medicolegal autopsy are:
- Authorization order/police docket
- The copy of FIR
- History of the case
- Identification of the deceased
- Place of performing autopsy
- Qualifications
- Verification of injuries noted by police Examination e.g. lividity → bruises
- preservation of viscera and other tissue

OTHER FORMALITIES

- Avoid unnecessary delay in performing autopsy.
- **Do not allow unauthorized person** into the mortuary. If allowed record a statement from him or her giving reasons for his or her presence and signature for being present during the autopsy.
- An autopsy is better done in the **daylight**. It should not be done in insufficient artificial light in order to prevent missing of findings such as **anemia, jaundice, color change in PM lividity**, etc. However, in situations for law and order problems, medico-legal autopsy may be conducted even in the night, with an order from DC, under strong artificial light having day light effect. The medical autopsy is done on all the days of week including holidays to avoid any delay in the process of crime investigations

- Prepare the PM notes during autopsy or arrange to tape-record the dictation.
- Prepare the PM report **immediately** or **within 24 hours** of autopsy examination in triplicates
 1. one for the investigating officer,
 2. second copy for the office file and the
 3. third one for the doctor who does the autopsy and sign it duly.
- Handover this report only to an authorized police officer/constable routed through proper channel.

PLACE OF PERFORMING AUTOPSY

- Preferably done in an equipped mortuary , **mortuary** is building usually part of hospital to which dead bodies are taken to be kept. **Autopsy room** is the part of mortuary where dead bodies are dissected
- **Autopsy is also done at site of recovery** of the cadaver in cases of **exhumation** and **putrefied body**.

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- If the medical officer finds some difference between description of injuries by the police and his observation he should report to **the SP of the district**.
- Authorization order /Police docket is usually in the form of request letter, which must be received by the **doctor prior to autopsy** and it depends on type of the case. However, never perform an autopsy examination without an authorization order. For better autopsy results always try to study all available facts about the case prior to autopsy .
- Hospital records (if any) such as **wound certificate, case file/sheet**, etc.
- Note: Confirm **HIV and HBV** status of the deceased whenever facilities available, as to take proper self-care and care of the other mortuary staff.

Notes Comments

External Examination

- It is the most important part of the medico-legal autopsy procedure as most of the information gathered at this stage can always help a lot in solving even the mysterious 'deaths. This includes examination of:

- **Clothes**

- Stains of mud, blood, urine, stool, saliva, semen, vomit pieces of glass, fiber, hair preserve for chemical analysis etc. whether cuts burns and holes corresponds to injuries on the body loss of buttons or disarrangements Stains on clothes should be kept for analysis.

Yellow-----nitric acid poisoning

mud -----drowning

Black-----sulphuric acid poisoning

grease-----RTA

Blood-----injury RTA

Semen -----sexual offence

Click to add title

- **Eyes** subconjunctival hemorrhages——suspected asphyxia death
- Black eye —————fracture anterior cranial fossa
- **Identity Body orifices**
- nose , mouth , ears, anus, urethra , look for **foreign bodies injuries , blood , pus , froth** or any change from normal is noted. Sample of discharge from urethra vagina and anus should be taken on swabs

- **Multiple tattoo** on upper extremities to hide needle tracks
- **Bite marks** on tongue lips may suggest terminal seizures from overdose of cocaine or amphetamine etc.
- The **limbs** and other parts of body should be examined for fracture and dislocations by suitable movements and palpation
- **nails with tags of epithelium -----struggle**
- **Scar marks, deformities.**

◦ Injuries

contusion

abrasion

laceration

incised wound

Stabbed wound/punctured wound

Fractures



Contusion



Abrasion



Laceration



Incised wound



Incised wound



Punctured Wound

◦ Rigor mortis

Rigor mortis is that state of muscles of dead body where they become stiff with some degree of shortening that follows the period of primary flaccidity. Rigor mortis is the stiffening of muscle after death. Along with stiffening of muscle, shortening of muscle fibers have been noted. When rigor mortis is developed completely, the body and joints become stiff with flexion attitude of upper limb muscles. Appearance of rigor mortis indicates death of individual cells (i.e. molecular death has occurred)

RM: time estimation

Warm	Flaccid	Death < 3 hrs
Warm	Stiff	3-8 hrs
Cold	Stiff	8-36 hrs
Cold	Flaccid	Death > 36 hrs

postmortem staining

starts appearing in small patches on the dependent part of body by the end of first hour after death. Gradually the small patches increase in size and coalesce with each other to form uniformly stained areas. For this complete spreading of postmortem staining, it takes about 6-8 hours.

Internal Examination

- This includes dissection and examination of the three major cavities and their contents, enumerated as:
- Dissection of cranial cavity.
- Dissection of thoracic cavity.
- Dissection of abdominal cavity.

- Depending on type of case, any of the body cavity can be opened first.

Spinal cord is routinely not opened except in cases

Local injuries

Sudden death following trauma without
apparent local injury

Requested by investigation officer

Arrange for

histopathological examination, chemical analysis, etc. as needed.

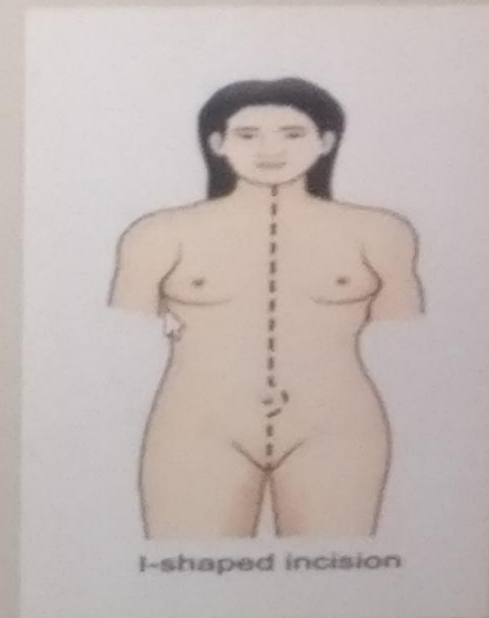
types of incisions

Several types of incisions are described, but only three types of incision are in practice routinely and described.

- I-shaped incision
- Y-shaped incision
- Modified Y-shaped incision.

I-shaped incision

1. I-shaped incision – a straight incision is made from the chin (symphysis mentis) to pubis (symphysis pubis). It is the commonest method used

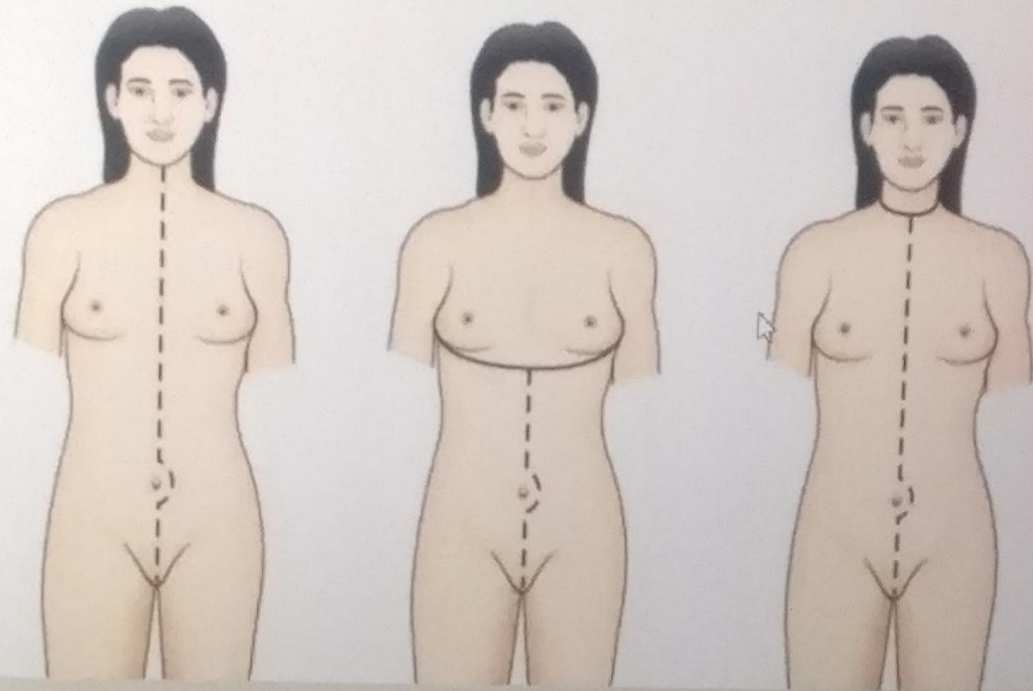


Y-shaped incision

2. Y-shaped incision – two incisions are made they commence on either side of neck from the angle of jaw to meet at manubrium sterni and then continue as a single incision down to pubic symphysis .this method is suited when detailed study of neck organs is required e.g. asphyxial deaths due to compression of neck

Modified Y-shaped incision

3. Modified Y-shaped incision – two incisions commence on either side of chest from anterior axillary fold ,curve under the breasts to at xiphi sternum and continue as a single vertical incision down to pubic symphysis



◦ **Dissecting cranial cavity includes following steps:**

- Scalp incision
- Removing the skull cap
- Opening the duramater
- Removing the brain
- Dissection of brain and its parts.

- During each of the steps enumerated above, proper examination of each of the following is done:
- **Scalp** — any injuries
- **Skull** — any fractures
- **Membranes** — hemorrhages, pus, etc.
- **Brain** — pressure manifestations, injuries, congenital anomalies, abscess, tumors, etc.

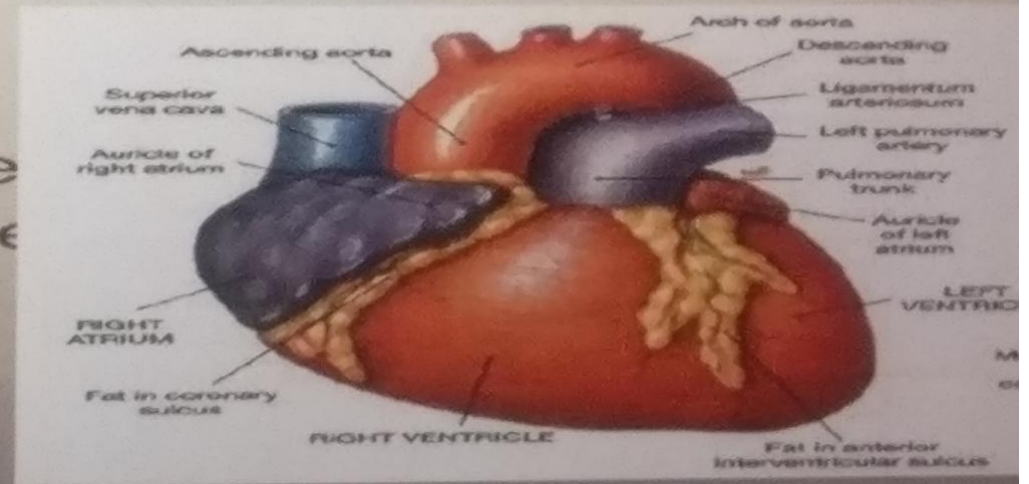
DISSECTION OF THORACIC AND ABDOMINAL CAVITIES

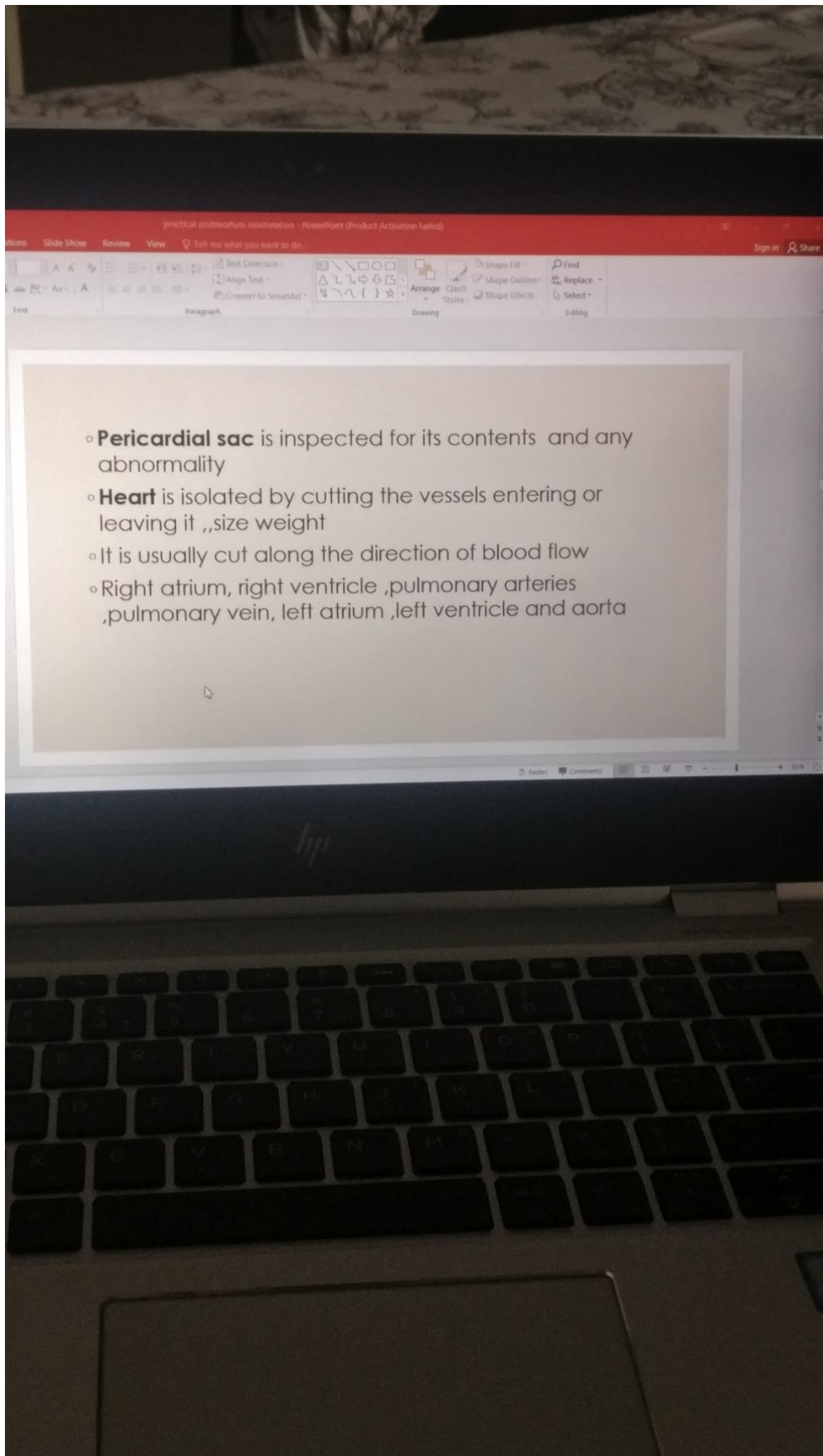
- The procedure includes several steps and they are:
- **Incisions**
- **Removing the abdominal and thoracic viscera**
- **Closing the body**
- **Handing over the body**
- **Preserving/dispatch of viscera to FSL.**

- Hilar vessels cut first
- First left then right
- Lungs are removed weighted injuries noted before cutting
- Lungs are cut laterally through the hilum first left then right
- Look for edema consolidation congestion emphysema infarction petechiae

Internal Examination of Thorax

- Pericardium
- Heart
- Chambers of Heart
- Coronary Arteries
- Aorta,

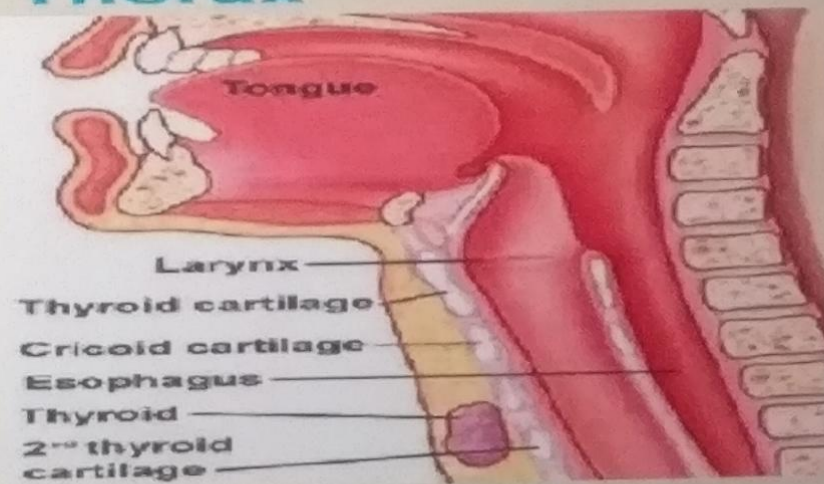




- **Pericardial sac** is inspected for its contents and any abnormality
- **Heart** is isolated by cutting the vessels entering or leaving it „size weight
- It is usually cut along the direction of blood flow
- Right atrium, right ventricle ,pulmonary arteries ,pulmonary vein, left atrium ,left ventricle and aorta

Internal Examination of Thorax

- Larynx,
- Trachea,
- Oesophagus



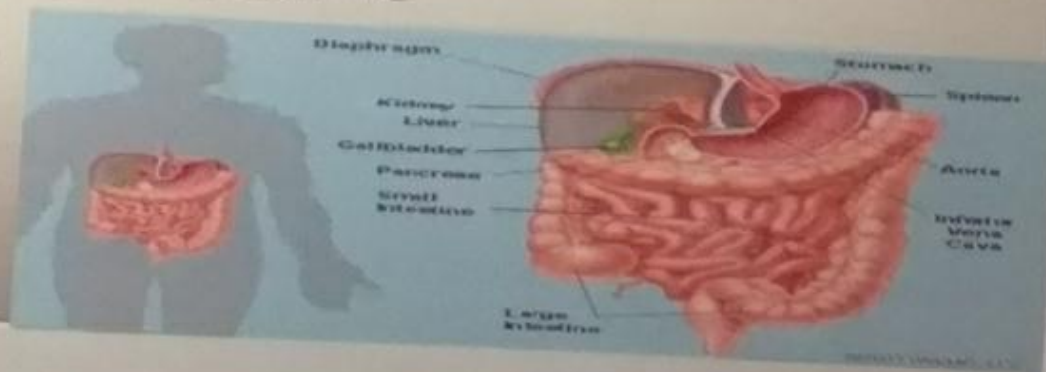
Internal Examination of Abdomen

- Peritoneum
- Abdominal Cavity
- Abdominal Organ
- Pelvic Cavity



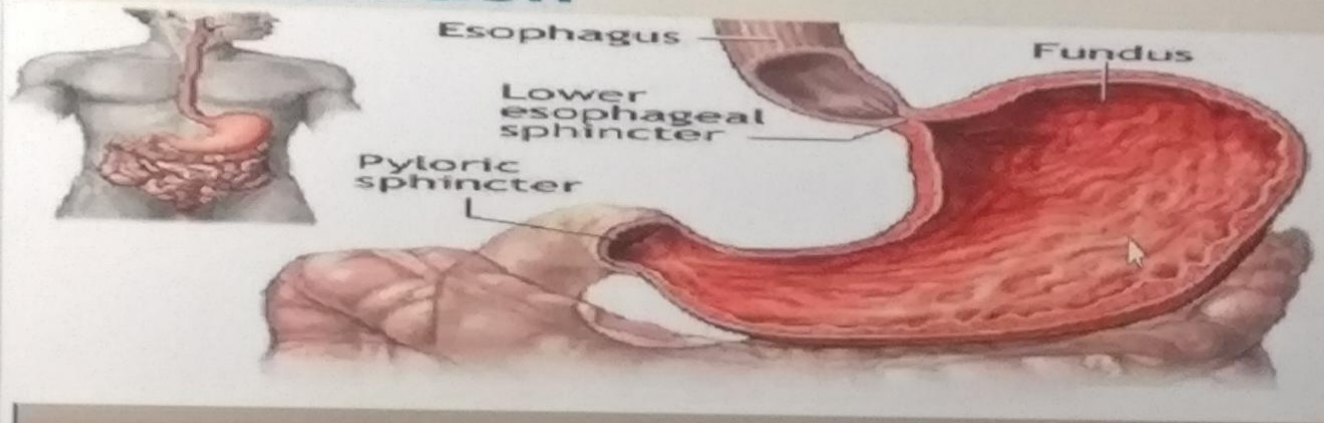
Internal Examination of Abdomen

- Stomach
- Small and Large Intestine
- Liver,
- Gall bladder

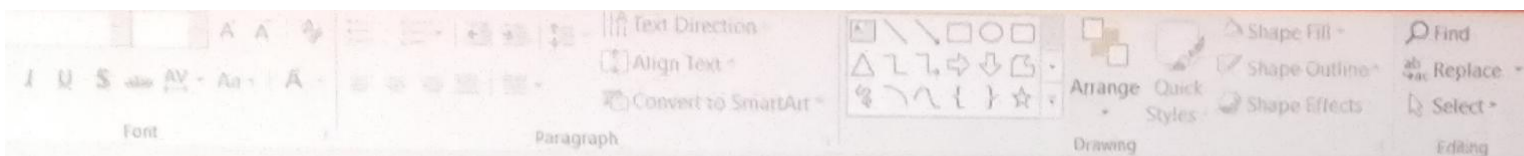


Depending on the rate of digestion of different types of food can be helpful in estimating the time since death
milk- 2hrs pulses- 5hr rice- 6 hrs. vegetable diet 6to- 8hrs

Stomach



- ✓ (Contents, Smell, Degree of digestibility)
- ✓ (Surface, Size, Weight)
- ✓ (Examine Inner Surface)



Abdomen

- Pancreas



- Spleen

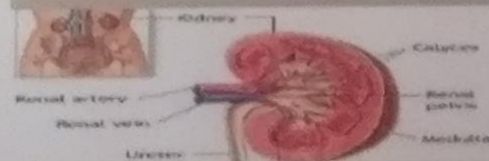
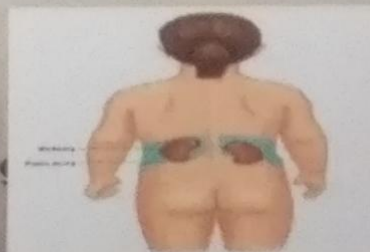


- Kidneys

- ✓ For Necrosis

- ✓ Size, Colour Weight

- ✓ Rupture, Calculi



Internal Examination of Male Pelvis

- Bladder
- Prostate
- Testes,



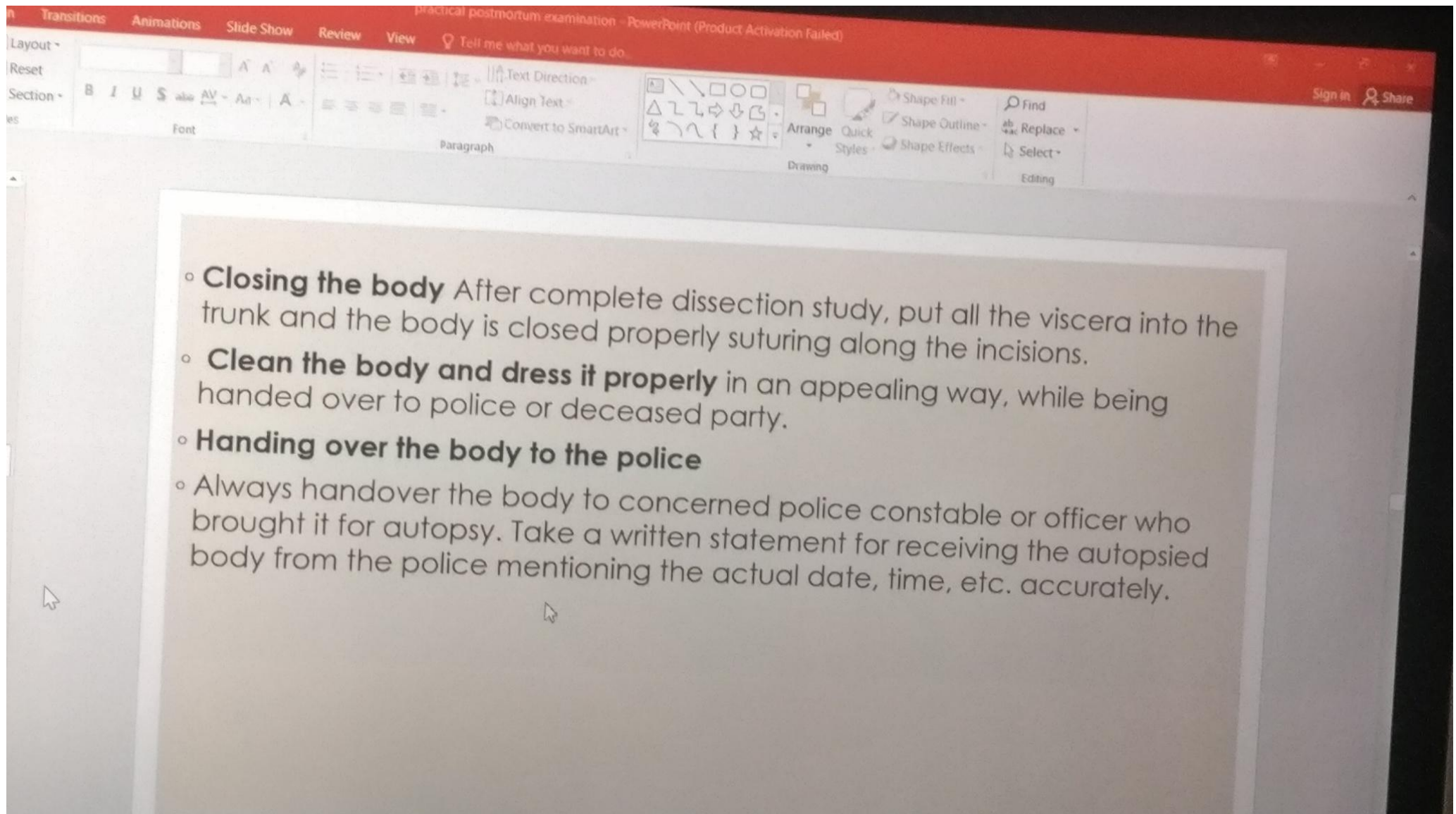
Prostate is removed along with the urinary bladder enlargement malignancy
testes and epididymis are examined for disease and injury

APPROACH TO EXAMINATION OF FEMALE PELVIS

Female Anatomy



Entire genital tract is removed as block along with urinary bladder and rectum
size shape weight and any abnormality
uterus — foreign body foetus fluid
vagina — foreign body rugae, inj marks condition and type of hymen



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50 Special procedures for specific cases These vary according to types of cases.

51

Slide 50 of 113

Notes Comments

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Special procedures for specific cases

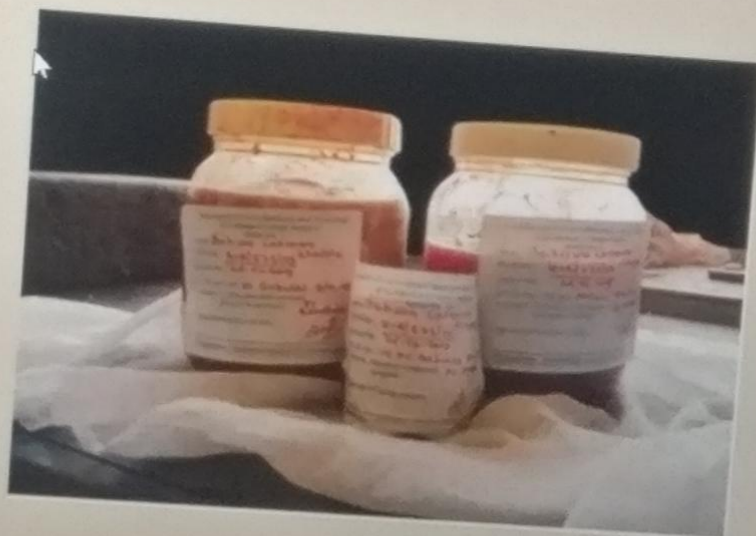
These vary according to types of cases,

- **Poisoning case** Take care to note following observation as found during the autopsy examination
- Smell
- Color of PM stain
 - Froth around mouth and nostrils
- Colour of sclera , lips and nails
- Mouth and its surroundings
- Corrosions
- Any injuries, fang marks , needle marks in the poisoning case etc.
- Gastrointestinal tract findings.
- Note Send viscera for chemical examination (FSL).

Collection of routine viscera and blood

<i>Specimen</i>	<i>Quantity</i>
Stomach	Entire stomach
Stomach contents	Entire (preferably)
Small intestine (jejunum)	- 30 cm in adults - Entire length in infants
Small intestinal contents	Up to 100 gm
Liver (portion containing gall bladder)	- 500 gm in adults - Entire in infants
Kidney	- One half of each kidney in adults - Both kidneys in infant
Urine	30-50 ml
Blood	10-20 ml

Collection of routine viscera at autopsy,



- 10 ml of blood is collected in a bottle preferably from peripheral site such as vessels of neck arm or leg
- The common practice is to collect from subclavian vessels when neck is dissected or femoral artery
- For alcohol estimation blood is not collected from heart pleural or abdominal cavities as it may give a higher value due to proximity to stomach from which may be seepage

- **Hanging/strangulation cases** Take care to note following
 - Ligature material and mark (method of should be photographed and described before removal) knot should be preserved by cutting the body of loop
 - Salivary dribbling marks
 - Face findings (eyes, pupils, and tongue)
 - Colour of lips nails and position of tongue.
 - Injuries to spinal vertebrae.
 - Distribution of pm staining
 - Presence of injuries on the body
 - Injuries to cervical spine and cord
 - Bloodless dissection of neck Here the cranial and thoracoabdominal cavities are dissected first, and neck and neck structures dissected last.

Firearms injuries

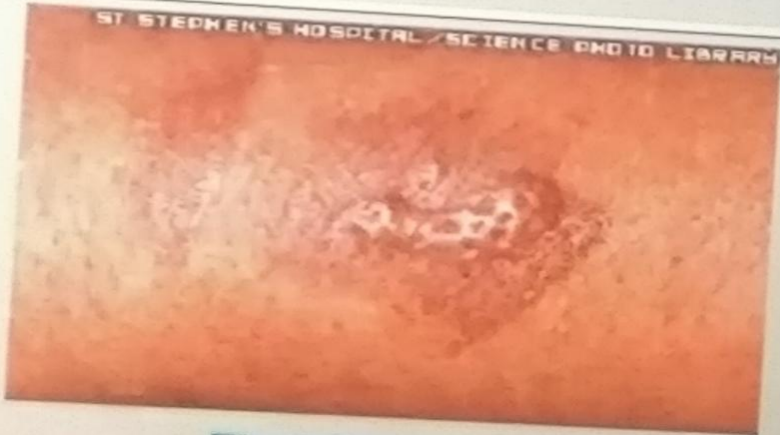
Take care to note following during the autopsy examination:

- Clothes
- Cadaveric spasm
- Radiological examination
- Details of wound
- Projectile fracture if any must be collected, preserved properly with proper marking, etc. dispatched to FSL.

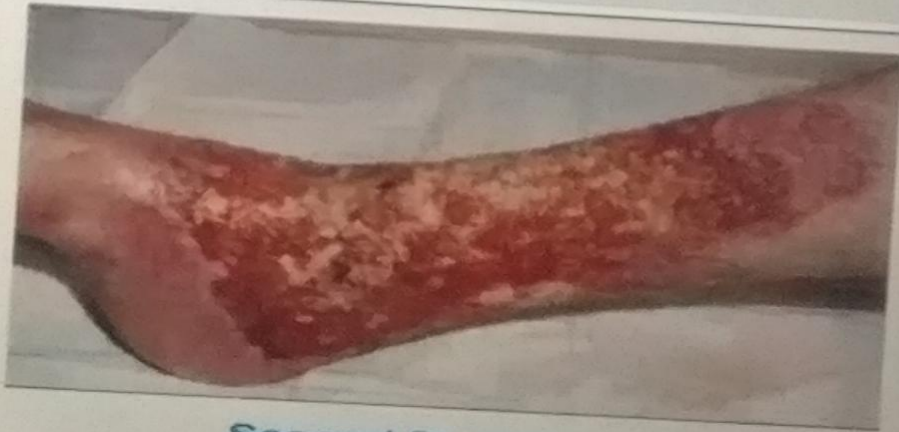
Burns

Take care to note following during the autopsy examination:

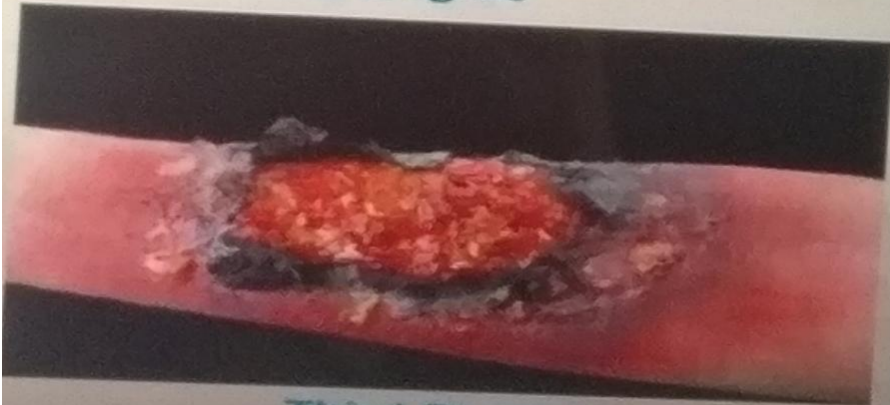
- Smell from body ,kerosene other inflammable agents
- Nature of burns
 - ante mortem
 - postmortem
- Age of burns or time since burns injury
- Color of postmortem stains
- Look for soot particles presence in air passages suggestive of ante mortem burns.
- Injuries other than burn
- Evidence of poisoning pregnancy , abortion and sexual assault



First Degree



Second Degree



Third Degree



Charred Body

Abortion

Take care to note following during the autopsy examination:

- Evidence of pregnancy and gestation period
- Criminal abortion — evidence
- Toxic substance — evidence Sepsis, etc.

newly born infants

- In case of newly born INFANTS where the question of livebirth and viability is to be determined
- Examine umbilical cord , length, condition dry,healing,or seperated
- Note the shape of chest weather arched or flat
- Look for ossification centers

calcaneum 20 weeks

talus 28 weeks

lower end of femur 36 weeks

Road traffic accidents

- Take care to note following during the autopsy examination:
- All injuries must be described
- Any foreign particles — preserved
- Alcohol — stomach, blood, urine
- Eyes — vision impairment evidence

Negative autopsy

- An autopsy that fails to reveal a cause of death with gross , microscopic, toxicological and other laboratory investigation is referred as negative autopsy. About 3 to 5 percent autopsies are negative. The causes of negative autopsy are given below.
- Causes
 - 1. Inadequate history
 - 2. Lapses in external or internal examination
 - 3. Inadequate sample collection
 - 4. Inadequate laboratory support.

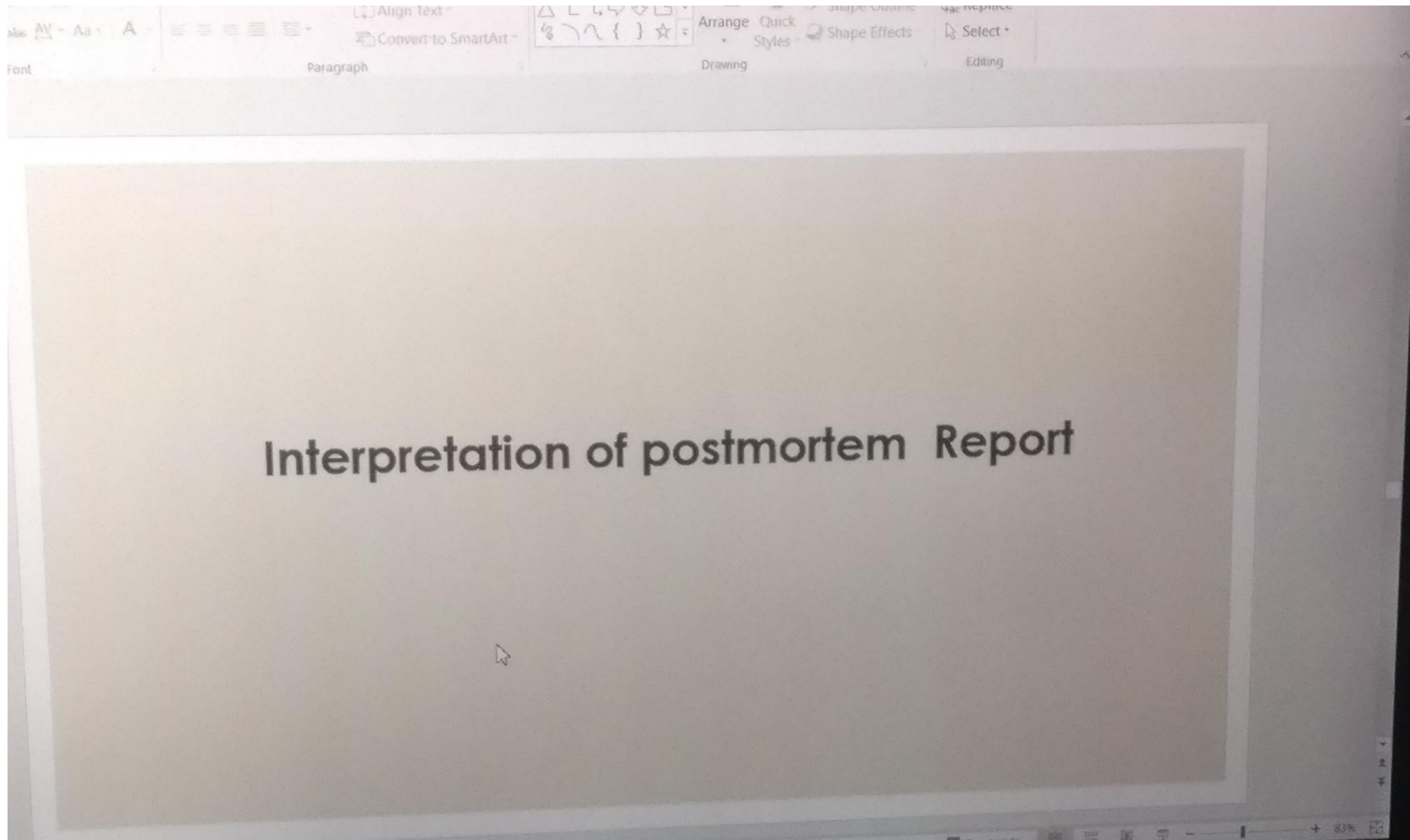
Obscure autopsy

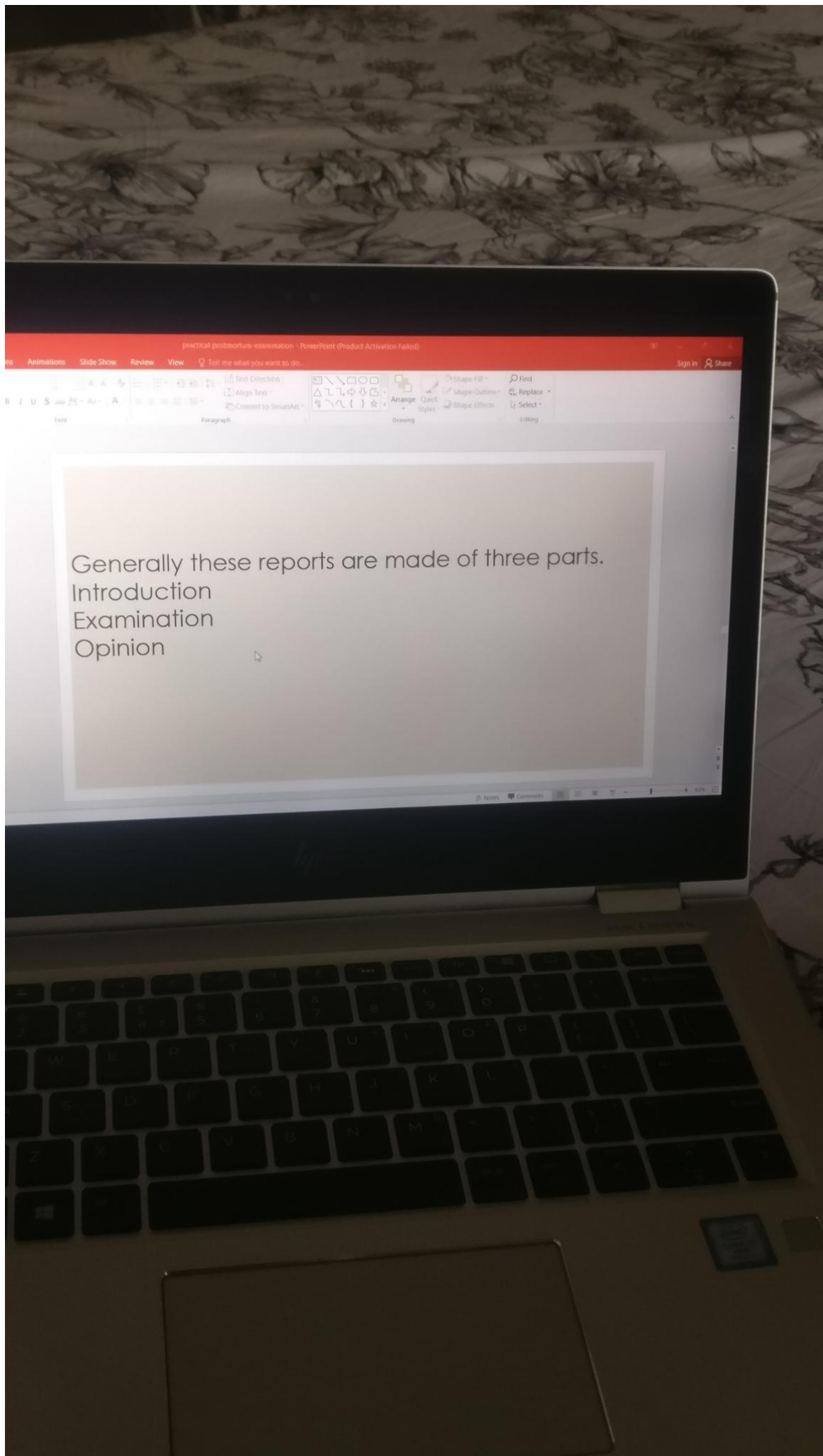
- In obscure type of autopsy, the findings do not lead to definite cause of death. There may be minimal, indefinite or obscure findings and causes confusion to medical examiner
- Causes of obscure autopsy
 - • Death due to endocrine dysfunction
 - • reflex Vagal inhibition
 - • Concealed trauma such as concussion
 - • Drug idiosyncrasy
 - • Biochemical disturbances such as Uraemic coma, hypoglycemia, hypokalemia, hyperkalemia etc.

The ideal samples are the ones in which no preservative has been added and sent to FSL within few hours. But, practically, it usually gets delayed.□

- The specimen is preserved at **4°C** until they are analyzed . For long-term storage, it has to be kept in freezer (**-10°C**).
- In order that putrefaction may not set in.
- 1. Viscera The most **commonly used preservative** for viscera is saturated solution of common salt. It is easily available, cheap and effective preservative . However, the **best preservative for preservation** of viscera is rectified spirit.

- In all cases of poisoning inclusive of carbolic acid but exclusive of other acid **saturated solution of saturated salt** should be used
- In the cases where poisoning by acid is suspected ,except carbolic acid ,**rectified spirit** should be used
- 10 percent formalin is used as a preservative for tissues meant for histopathological examination





Generally these reports are made of three parts.

- Introduction
- Examination
- Opinion

Autopsy report

- When autopsy is completed, the medical officer must form an opinion as to the cause and manner of death and probable time since death and cause of death
- The abstract of opinion should be given to police constable accompanying the dead body for communication to investigating officer.

contents of the autopsy report

- Name
- Age
- Sex
- Time of arrival of body
- Date, place and time of examination
- body identified by
- 1-----2-----
- Body brought by
- Village, Thana and district

The body of report

External and internal examination ; general condition of body

Healthy stout , emaciated decomposed

Injuries

nature

direction

situation

size

complete description of external examination

- Condition of body
- clothes
- eyes
- State of natural orifices,
mouth or nose ears anus urethra and vagina
- Injuries nature .position and measurements
- State of limbs
- postmortem lividity
- rigor mortis

complete description of internal examination

I

opinion

- Consist of opinion drawn by the doctor from postmortem examination.
- After conducting postmortem examination I am in opinion that death of deceased is due to firearm inj causing damage to vital organ heart and hemorrhage shock and death

- Report of autopsy is usually given **within 24 hrs.** after conducting autopsy
- Sometime medical officer is unable to draw conclusion at the time of Postmortem then he sends the specimens the forensic science lab for
- Chemical examination
- Histopathology examination
- DNA.
- Medical officer will issue final report after receiving reports from the above said authority.

Yearly No. _____

Serial No. _____

POST MORTEM REPORT

on the body of

Name _____

Father's Name or _____

Husband's Name _____

Caste _____

Residence _____

Sex _____ Age _____

District _____

Body brought by

Body identified by

When brought
(Village, thans, district)

DATE AND HOUR OF

Death	Examination of body	Dispatch of matter to Chemical Examiner
Symptoms observed before death		
Information furnished by Police		

N.B:- The medical officer will observe the state of all the organs and when he finds no disease injury, he should write in the appropriate place the word "healthy".

I. EXTERNAL APPEARANCE

Mark of ligature on neck and dissection etc.	
Condition of subject (Stout, emaciated, decomposed etc) and clothing	
Wounds, bruises (position, size, nature)	

1. The student must examine the specimen carefully and record the findings in the following table. If no disease/injury/damage is observed, the word "Healthy" should be written.

II-CRANIUM AND SPINAL CORD

Scalp: Fractured, damaged
 Skull: [↑] Damaged - T
 Membranes: Damaged
 Brain: Damaged
 Vertebrae: /
 Spinal Cord: not opened

III-THORAX

1- Walls, Sternum (Manubrium, Body, Xiphisternum), Cartilages and Ribs.	Damaged
2- Pleurae	Damaged & sided pleura
3- Larynx & Trachea	Healthy
4- Right Lung	Damaged. Cavity Full of blood
5- Left Lung	Healthy
6- Pericardium & Heart	Heart empty. Pericardium Healthy
7- Blood Vessels	Healthy

Signature of Student: *al*

practical postmortem examination - PowerPoint (Product Activation Failed)

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V. MUSCLES, BONES, JOINTS			
Injury	Disease of Deformity	Fracture	Dislocation

VI. REMARKS BY MEDICAL OFFICER

Probable time that elapsed	
a. Between injury and death	
b. Between death and	

Station _____
Dated _____

Signature & Designation of
Medical Officer

II. CRANIUM AND SPINAL CORD

N.B:- The spinal cord need not be examined unless any indication of disease o

Scalp, Skull and vertebrae

Membranes, brain

III. THORAX

1. Walls, ribs and cartilages	
2. Pleurae	
3. Larynx and trachea	
4. Right lung	
5. Left lung	
6. Pericardium and Heart	
7. Blood vessels	

IV. ABDOMEN

1. Walls	
2. Peritoneum	
3. Mouth, pharynx and oesophagus	
4. Diaphragm	
5. Stomach and its contents	
6. Pancreas	
7. Small intestines and its contents	
8. Large intestines and its contents	
9. Liver	
10. Spleen	
11. Kidneys	
12. Bladder	
13. Organs of generation (internal and external)	