Chapter III
THE AUTOPSY

- One of the basic foundations of medicine is:
  "The study of the morphologic alterations induced by disease."
- **Pathologic anatomy**, being the best approach to medical practice and research, has imposed the course in pathology to be so designed as to allow ample opportunity for the **study of gross material aiming at a better understanding of the clinical aspect**, on scientific basis.

AUTOPSIES

- In learning the fundamentals of a disease, nothing can replace attendance in the clinical wards and in the autopsy-room

  - **Students, in subgroups, and**
  - **Practicing-physicians and**
  - **Surgeons**
- Should attend necropsies performed **on patients who were examined by them** on the medical and surgical wards.
- Each of them has thus the opportunity to deal principally *with the functional alterations of morbid conditions as shown by symptoms and signs of the patient in the ward.*

- At the same time, **his mental conception of the disease is solidified** by the gross picture of the diseased organ as seen in the dissected body at the autopsy room.
- This offers the means of **comparing the clinical findings with the structural changes** disclosed at autopsy.

- ***If the clinical diagnosis proved correct, the knowledge is strengthened.***
- If it was incorrect, better knowledge is benefited for similar patients in the future.

1. Autopsy Dissection and its Aim

- A scientific post – mortem dissection for examination of the body after death aims
    - **At the discovery of the causes of death** and
    - Tries to **interpret the gross pathological lesions** to **the clinical features.**
- **It should fulfill the following:**
    1. Explain **why the patient was sick**; and, **why and how he died**.
    2. **Teach the medical student** the subject of morbid anatomy.
    3. Develop in the student the ability to **visualize the gross morphologic picture** of the diseased organ in a **patient supposedly-suffering from the same particular disease.**
    4. **Supply the museum with the necessary illustrative specimens** of the diseased organs (diseases).
    5. **Link the anatomic findings with the clinical diagnosis**.
    6. Determine **whether death has resulted from**
        - ***Natural causes,***
        - ***Shock,***
        - ***Accidents or***
        - ***Otherwise.***
    7. **Procure tissue-grafts** (skin, blood vessels, cartilage, bone, muscle, eye etc.) to be utilized in transplantation and surgical operations.

2. Value of performing Autopsies

1. **Contribution to a better care** of next hospital patients seeking relief from a disease from which previous patients had suffered (and were autopsied and the correct diagnosis was reached-at only after death).

   (**The dead teaching the living**)

2. Sometimes, however, the disease may have no bearing upon the actual cause of death, and it may have been **only a contributory factor**. Familial, hereditary or infectious diseases may be revealed only at autopsy; and, their recognition may be of value in **guarding the health of the remaining members of the family**

3. The autopsy is not entirely completed after dissection and examination of the various organs and structures.

4. There still remains the
   - Correlation of the pathologic findings;
   - Demonstration of possible cause-and-effect relations of the lesions and also
   - The explanation of the clinical manifestations on the light of the autopsy findings.

5. The clinical diagnosis must be checked with the anatomic diagnosis to **explain the various clinico-pathologic tests** on the basis of the morphologic changes and later still with the histologic findings.

- A final diagnosis may not be reached except **after the histologic study is done**.
- Even then, there are cases which may unexpectedly die from **natural causes** such as
  - Sudden strong emotion or
  - Severe physical exercise raising the arterial blood pressure.
- Certain cases of deaths **are not to be dissected except by the medicolegal specialist.**

• **Of accidents,** • **Poisoning,** • **Burns,** • **Violence.** • **Cases without previous medical attention,** • **Abortion** • **Alcoholism,**	• **Un-natural deaths,** • **Suicide,** • **Homicide** • **Trauma and** • **Deaths occurring during surgery or under anesthesia and** • **Bodies from casualties or play.**

- It is advisable not to start an autopsy on a body that contains **radio-active material** without advice from the radiation-safety officer", particularly if it contains **more than 5 milli-curies of radio-active material.**

- **Relatives of the dead patients are not allowed to attend the autopsy** dissection; but, they may be informed that a special examination has to be done to determine the cause of death.

3. Post-Mortem Unit (Room and Equipment

- Post-mortem room especially designed.
- Autopsy-table. (Porcelain).
- Dissecting-table. (Wood).

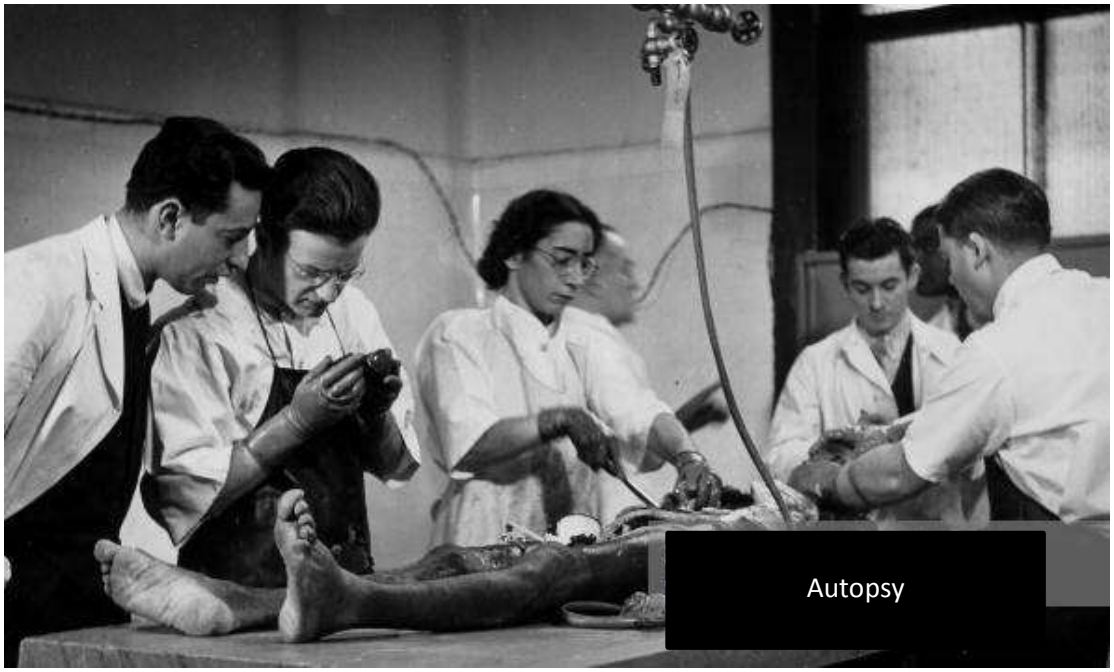
	Instruments	***Miscellaneous Equipment***
• Head-block. (Wood). • Sponge-basin. • Spring-balance. • Small bench. • Sink for running water.	• Knives. • Scissors. • Forceps. • Sheers. • Chisels. • Saws. • Probes and • Grooved directors. • Mallet and hammer. • Metal catheters. • Steel-ruler. • Measuring cylinders • Needles.	• Aprons (rubber) and gowns. • Gloves (rubber and cotton). • Tape-measure. • Soap and nail-brush. • Enamel-buckets. • Specimen-jars. • Sterile test-tubes. • Pipettes. • Swabs and platinum-loops. • Glass-covers and slides for microscopic study of scrapings. • Formol-saline 10% solution. • Alcohol 75%. • Antiseptic lotions.


Instrument	**Uses**
Autopsy table	for dissection of the corpse
Dissection scissors	used to hold or move structures
Arterial & jugular tubes as practiced in Anatomy	to draw or drain out all the blood before replacing it with embalming fluids like formaldehyde for preservation of structures
Head rest	to elevate the head
Restraint	to hold the corpse in place so that it does not change position during dissection

Rubber gloves	to protect against infection, and to prevent contamination of evidence
Goggles	to protect against infection
Jackets, aprons, etc.	to protect against infection
Autopsy saws	to cut tough structures like bones
Blades	to cut the skin
Towel clamps	to hold towels in place
Skull breaker or often a (hammer and chisel)	to break open the vault of the skull
Bone saw	for cutting bones
Sternal saw	for cutting into the chest of the body by cutting the sternum
Scalpel	sharp cutting instruments
Toothed forceps	for tearing or holding structures
Mallet	used as a hammer
Autopsy hammer	used just as a hammer
Skull key	a T-shaped chisel used as a lever while removing skull cap
Brain knife	to cleanly cut the brain
Rib shears	to cut through the ribs while opening the chest
Dissecting scissors	for sharp cutting
Speculum	for vaginal and rectal examinations
Non-absorbable sutures	usually nylon to close the body cavities and sutures it
Postmortem needles	large thick needles for suturing the skin after an autopsy to return the body to a natural looking state to prepare it for burial
Medical syringes	for fluid aspiration
Foley catheter	for evacuation or irrigation of the bladder to collect a urine sample
Nasogastric tube	for nasogastric aspiration of stomach contents; usually it is not used
Water bath	for flotation tests to detect presence of gas, especially for infants (lungs, intestine) as a sign of postpartum life
Specimen jars	preservation of material evidence

Swabs	collecting smears
Metacarpal saw	a bone saw
Double-ended probe	used for probing
Tongue tie	to tie away the tongue so that it doesn't fall back into the pharynx
Formaldehyde	primary preservative for Anatomy;
saturated salt solution	Primary preservative for Autopsy;
Rectified spirit	Primary preservative for Autopsy;
Osteometric board	to measure the length of (usually dried) bones
X-ray boxes	to view X-ray images
Fingerprint set	to collect fingerprints;

Post Mortem Technique



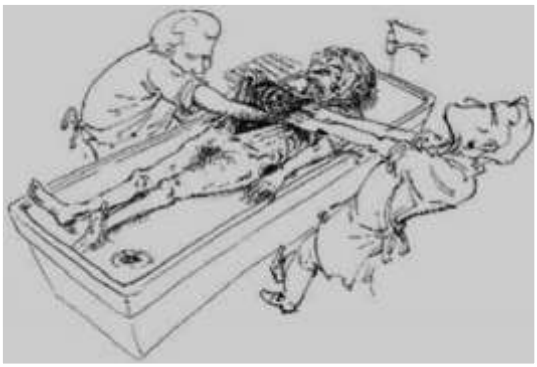
a) Types:

1. Virchow-Technique:

- Each organ is removed, dissected and examined separately.

2. Ghon-Technique:

- Related organs are removed together.
- The relation between these organs may be anatomical (heart and lungs) or physiological (respiration).



3. En-Masse Technique:

- The chest organs are removed as one piece with those of the abdomen.
- They are dissected, outside the body, beginning posteriorly and ending anteriorly,
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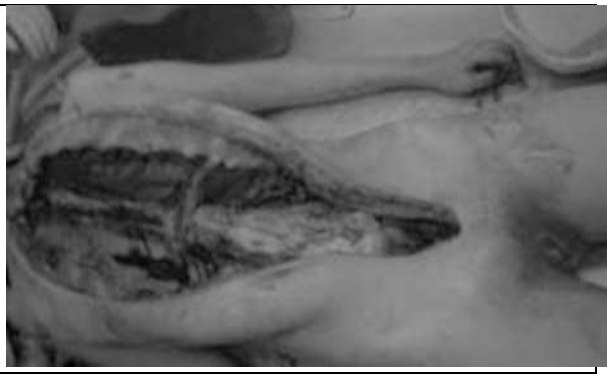
4. Rokitansky-Technique:

- A particular organ is dissected in situ in the body in order to confirm the clinical diagnosis or-and the cause of death.

5. Terry Technique

- or "Needle Necropsy":
- Where diagnostic post-mortem specimens can be obtained by a needle using a
    - 20 ml. syringe,
    - a needle 15 cm-in length and 3 mm internal diameter and a
    - Trocar on the piston.
- This is used when dissection is opposed or is impossible.



(b) Preparatory Measures and External Appearances.

1. Review:

- **The patient's hospital records** including the
  - History,
  - Physical examination,
  - Clinical diagnosis,
  - Course of disease
  - Laboratory investigations and
  - X-ray investigations and
  - The points of special interest to the treating doctor.

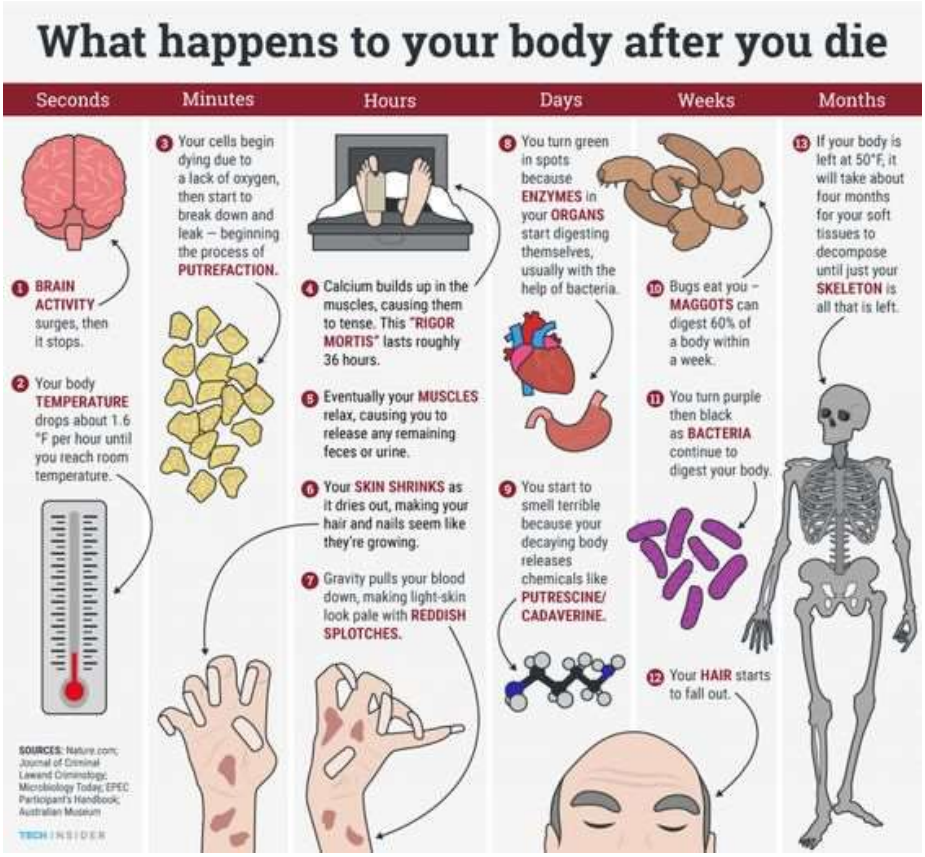
2. Identify: **The body.**

- *Note: The age, sex, length, weight and development of the body and examine its surfaces.*

3. Ascertain:

- That there are no signs of life
    - Cessation of: Heart-beat, respiration, sensation and functional activities.
    - Progressive coldness and stiffness of the body.
    - Dullness and increase opacity of cornea and loss of tone of the eye-ball.

4. Observe:

- Post-mortem rigidity and discolouration.
    - Morphology and distribution of rash.
    - Pigmentation,
    - Laceration,
    - Wounds,
    - Haemorrhages and
    - Jaundice.
- 

5. Notice:

- The colour of the sclera,
- Size of pupil,
- Distribution of hair and subcutaneous fat and
- Sites of edema.

6. Look for:

- Any discharge from the natural orifices of the body such as nose, mouth, ear, anus, vagina etc.,
- Their odor may help in the diagnosis.

7. Note:

- The shape of the chest and abdomen and
- the condition of the limbs as well as
- the external appearances in general including examination of
    - **The scalp,**
    - **Ears,**
    - **Eyes,**
    - **Nose,**
    - **Lips,**
    - **Breasts and**
    - **Genitalia.**

Notice and record:

- Anything unusual in the external appearance of the body.

(c) Routine Procedure.

I - General Rules:

1. Acquire a **neat unhurried technique**; an autopsy should approach a surgical operation in cleanliness, **the body must be kept clean** and blood must be washed off.
2. Keep **instruments and equipment in good order.**
3. **Inspect the body** as a whole then the different parts separately.
4. Sear the **surface area and make a preliminary incision** with a sterile knife before taking samples for cultures from the interior of organs.
5. Dictate notes to an assistant (a medical student) during the dissection which is performed with the help of another assistant (a medical student) as well as an expert technician.
6. **Prevent sources of infection** and do not perform autopsies unless the hands and arms are healthy and clean.
7. A **stream of running water** must be used during the autopsy but with discretion.
8. All organs should be **handled with care and artefacts avoided**.

II — Summary of Steps for Internal Examination:

1. ***Primary incision** of skin and subcutaneous tissue of the neck, thorax and abdomen.*
2. ***Inspection** of the peritoneal cavity and abdominal organs.*
3. ***Opening** and exposure of the thoracic cavity.*
4. ***Inspection** of the thoracic viscera.*
5. ***Removal** of the cervical and thoracic viscera.*
6. ***Dissection** of the cervical and thoracic viscera.*
    a) ***Dissection** of the pericardium and heart; and,*
    b) ***Examination** of the vessels in continuity with the heart.*
    c) ***Examination** of the lungs.*
7. ***Removal and dissection** of the abdominal viscera.*
8. ***Removal and dissection** of the urogenital tracts, adrenal glands and the rectum.*
9. ***Dissection** of the remaining abdominal viscera.*
10. ***Removal** of the brain and its examination*
    - *External at time of autopsy and*
    - *Internal after fixation.*

11. Examination of the base of the skull.
12. Examination of the orbit.
13. Examination of the ear.
14. Examination of the cranial air sinuses and nasopharynx.
15. Removal and dissection of the spinal cord.
16. Examination of specific peripheral nerves and neuromuscular apparatus.
17. Examination of bones, cartilage, joints and bone marrow.
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