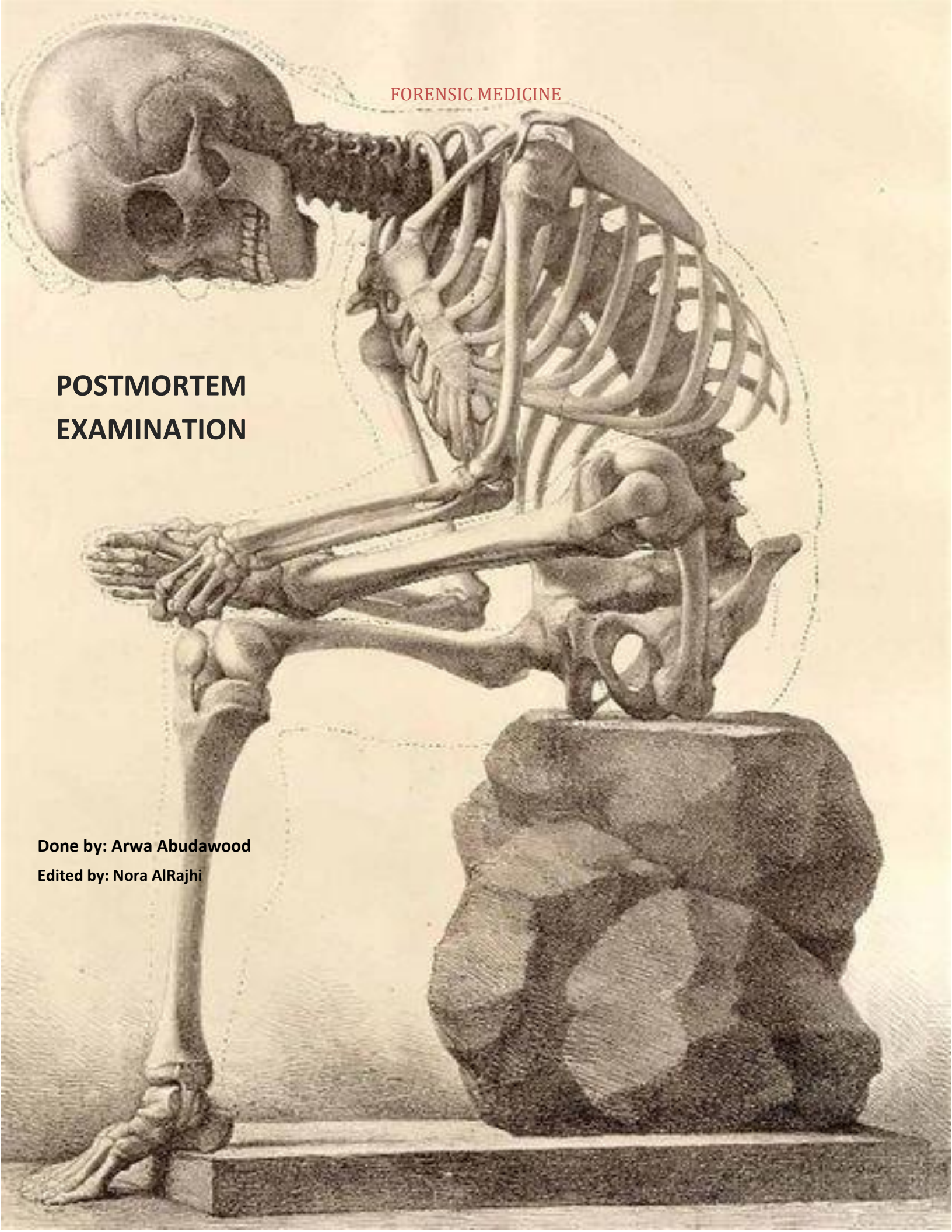


FORENSIC MEDICINE

POSTMORTEM EXAMINATION

Done by: Arwa Abudawood

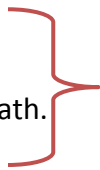
Edited by: Nora AlRajhi



AUTOPSY

An autopsy is the examination of a dead body to determine or confirm the cause of death. It's can also be called necropsy, postmortem or postmortem examination.

There are two types of autopsies:

- **Hospital/Clinical autopsy:** this is done out of clinical interest and it needs consent from the deceased next of kin. It's usually done to check for side effects and to get feedback for therapeutic purposes and establish details of pathophysiology of disease. A death certificate is signed.
- **Medico-legal autopsy:** this is done for medico-legal purposes, its ordered by the forensic system (ME or Coroner). This does not need consent from the deceased relatives. (A death certificate is not signed/it's reviewed) It's done to:
 1. Establish decedent's identity.
 2. Establish the cause of death.
 3. Determine the mechanism of death.
 4. Confirm the manner of death. Components of the death certificate
- 5. Confirm medical history.
- 6. Rule out disease or factors harmful to public health.
- 7. Facilitate adequate photography of wounds i.e. entry, exit and related injuries (internal and external).
- 8. Establish direction of force.
- 9. Correlate wounding and object producing the wound(s).
- 10. Determine time interval between wound(s) received and death.
- 11. Establish sequence of events.
- 12. Retrieve an article (evidence) involved in mode of death, such as a bullet.
- 13. Obtain and examine trace evidence such as hairs, stains, and seminal fluid.
- 14. Obtain specimens for toxicology.
- 15. Establish order of death in situations where more than one family member has been killed.
- 16. To document all injuries in order to answer any future questions that are unknown at the time of the autopsy.

Before the actual postmortem examination:

- If the death is definitely due to crime or if there is a possibility of crime (a suspicious death), **the forensic pathologist may attend the scene before the body is moved** in order to, gain an understanding of the surroundings and blood distribution in relation to the body.
- Notes of attendance, people present and observations should be made.
- Photographs should be taken of the scene, in general, of the body in particular and of any other significant features; these are usually taken by **the forensic photographer**.
- The identity of the body should be confirmed to the **forensic pathologist** by a **relative** or by a **police officer** or **other legal officer** who either knows the deceased personally who has had the body positively identified to them by a relative or by the deceased I.D. card or by scientific means (e.g. fingerprints).
- If the remains are mummified, skeletalized, decomposed, burnt or otherwise disfigured to a point at which visual identification is impossible or uncertain, or if the identity is unknown other methods of establishing the identity of the remains must be used, but the autopsy cannot be delayed while this is done.
- In a suspicious death, the body should be examined with the clothing in place so that defects caused by trauma that may have damaged the body (stab wounds, gunshot injuries, etc.) can be identified. The body should also be photographed clothed and then unclothed and then any injuries or other abnormalities should be photographed in closer detail, diagrams should also be drawn to clarify any abnormality. After removal, the clothing must be retained in new clean bags that are sealed and carefully labeled for the forensic scientist to examine later.
- **X-rays** are advisable in victims of **gunshot wounds and explosions** and where there is any suspicion of radio-opaque material such as a possibility of retained metal fragments, and are **mandatory** in all suspicious deaths in **children**. In many offices all children under 2 years of age and perinatal.
- The surface of the body should be examined for the presence of trace evidence: fibers, hair, blood, saliva, semen, etc. This examination may be performed by police officers or by **forensic scientists, often with the assistance of the forensic pathologist**. **That is if the samples are to be removed from the body itself as opposed to the surface of the body – fingernail clippings, head and pubic hair, anal and genital swabs – these should be taken by the forensic pathologist into paper tagged bags to guarantee chain of custody.**

The Autopsy

The postmortem examination comprises of an external and an internal examination.

1. External examination:

The victim's clothing and belongings; and inventory of jewelry, valuables and evidence recovered should be documented. Body weight and length; presence of algor, rigor or livor mortis; general condition of the body should also be recorded. A description of the color and condition of head and body hair is also important. Examination of the nose and mouth to include dental examination. External condition of body areas to include the breasts, genitalia, ears and skin; any scars or incisions; any puncture marks to include those of needles and medical intervention; and, specific injuries are noted, such as stab wounds, gunshot wounds or blunt instrument injuries.

- **Careful documentation** of the external features of injuries or abnormalities -if any were present- their position, size, shape and type, is often the most important aspect of a forensic examination and often has much greater value in understanding and in reconstructing the circumstances of injury than the internal dissection of any wound tracks or of damaged internal organs.

2. Internal examination:

The internal examination must fulfill two requirements,

- i. to identify and document injuries and
- ii. to identify and document natural disease.

The former may involve the examination of wound tracks caused by knives, bullets or other penetrating objects. It may also involve determining the extent and depth of bruising on the body by reflecting the skin from all of the body surfaces and identifying and describing areas of trauma to the internal organs.

A complete internal examination of all three body cavities, with dissection of all of the body organs, must be performed to identify any underlying natural disease. Samples of vitreous, blood and urine (for toxicology) will be routinely requested by the police. When poisoning is suspected, other samples including stomach contents, intestinal contents samples of organs including liver, kidney, lung and brain, may be requested and in children CSF. The storage, preservation and handling of these specimens will depend upon the suspected poison. Specialist advice must be obtained or the samples may be useless.

Tissue samples should be retained in formalin for microscopic examination. If there is any doubt, whole organs – brain and heart in particular – should be retained for specialist examination. **Samples should be taken for toxicology and histology as necessary.**

When performing the postmortem, an incision is made till the pubis. The upper margin may be extended on each side of the neck to form a 'Y' incision (a 'U' incision is made for females). The extra exposure this brings is useful in cases of neck injury or in children. The scalp is incised coronally and the flaps reflected forwards and backwards. The skull-cap is carefully sawn through and removed, leaving the dura intact. This is then incised and the brain removed by gentle traction of the frontal lobes while cutting through the cranial nerves, the tentorium and the upper spinal cord.

Detailed notes should be taken at the time of examination, and a report must be written as soon as possible even if it cannot be completed because further tests are being performed. All reports should include all of the positive findings and all of the relevant negative findings. Because in court the absence of a comment may be taken to mean that it was not examined or specifically looked for and, if a hearing or trial is delayed for many months or years, it would not be credible to state that specific details of this examination can be remembered with clarity.

References:

- Simpson's Forensic Medicine, 13th edition. P.31-33 + Appendix I
- <http://www.in.gov/ctb/files/section501.pdf>