



# ***Forensic Pathology Notes***

***By- Dr. Armaan Singh***

**- postmortem investigation of  
sudden or unexpected death or  
trauma to the living**

## *Role of the Forensic Pathologist*

**4 broad determinations to be made:**

**A. Cause of Death – medical diagnosis denoting disease or injury**

**B. Mechanism of Death – altered physiology by which disease/injury produces death (arrhythmia, exsanguination)**

**C. Manner of Death**

- 1. Homicide**
- 2. Suicide**
- 3. Accidental**
- 4. Natural Causes**
- 5. Unknown**

**D. Time of Death**

## *Time of Death*

Can estimate time of death from

- **body temperature (algor mortis)**

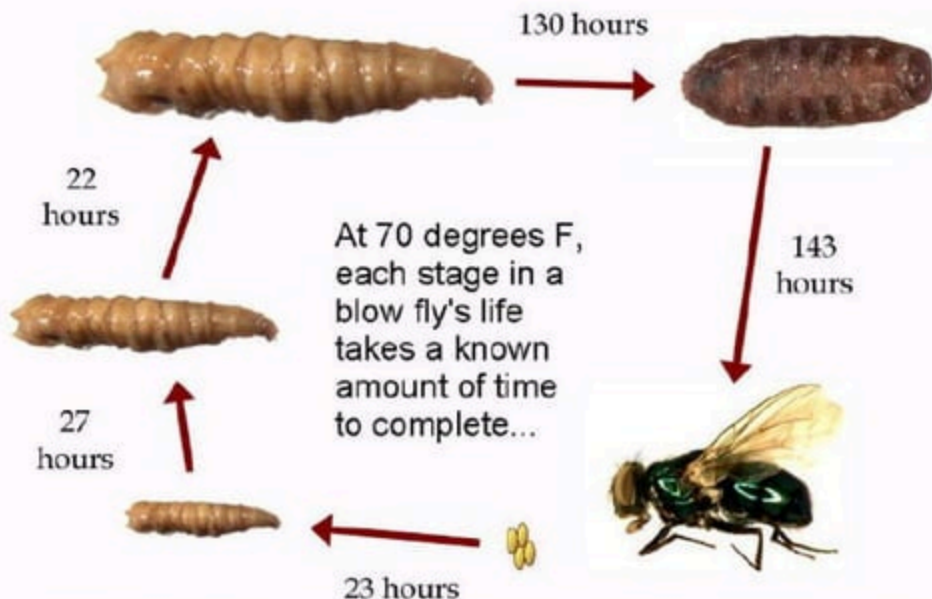
estimate:  $[98.6 \text{ }^\circ\text{F} - \text{rectal temp}]/1.5$

- **insect action (forensic entomology)**
- **stomach contents (stage of digestion)**
- **last known activity (last sighting, newspaper/mail)**
- **normal postmortem changes**

# Time of Death

## Entomology

The blow fly life cycle has six parts: the egg, three larval stages, the pupa, and adult.



## *Time of Death*

Can estimate time of death from

- **body temperature (algor mortis)**

estimate:  $[98.6 \text{ }^\circ\text{F} - \text{rectal temp}] / 1.5$

- **insect action (forensic entomology)**
- **stomach contents (stage of digestion)**
- **last known activity (last sighting, newspaper/mail)**
- **normal postmortem changes**

## *The Body Farm*

**1 acre of land owned by the University of Tennessee**



## *Normal Postmortem Changes*

- 1. rigor mortis**
- 2. livor mortis**
- 3. desiccation**
- 4. putrefaction**
- 5. cell autolysis (also called butyric fermentation)**
- 6. dry decay**

## *Rigor Mortis*



**Body warm**

**not stiff**

**less than 3 hours**

**Body warm**

**stiff**

**3-8 hours**

**Body cool**

**stiff**

**8-36 hours**

**Body cool**

**not stiff**

**more than 36 hours**



*Livor Mortis*



## *Desiccation*



## *Normal Postmortem Changes*

1. rigor mortis
2. livor mortis
3. desiccation
4. *putrefaction* (days 4-10)
5. *cell autolysis* (days 10-20)
6. *dry decay* (days 20-50)

# *Trauma to the Human Body*

## **Role of the Pathologist**

- 1. Determine type of wound**
- 2. Measure the dimensions (length, width, depth)**
- 3. Position relative to anatomical landmarks**
- 4. Determine initial location if wound involves cutting, slashing, etc.**
- 5. Determine height from heel**

## *Types of Wounds (Trauma)*

- 1. Lacerations**
- 2. Incised Wound**
- 3. Puncture**
- 4. Abrasion**
- 5. Contusion**
- 6. Gunshot**

# *Lacerations*



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## *Incised Wounds*

**Slash**



**Stab**



**Puncture – penetrating injury due to an object with no blade**

## *Abrasions*





## *Contusions*

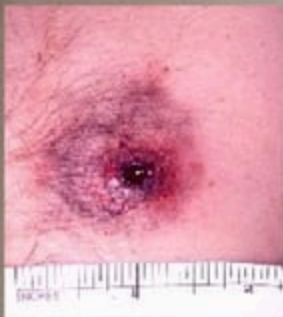


**Color changes a bruise goes through can give rough estimate of time of injury**

- **Dark blue/purple (1-18 hours)**
- **Blue/brown (~1 to 2days)**
- **Green (~ 2 to 3 days)**
- **Yellow (~3 to 7 days)**

**Assumes person is healthy.**

## *Gunshot Wounds*



### **Things for pathologist to learn:**

- **type of firearm**
- **distance of gun to victim**
- **entrance vs exit wounds**
- **track of projectile**

## *Gunshot Wounds*



**Starring of a contact wound – barrel touching the skin**



**Stippling – powder burns on the skin when the gun is inches to a few feet from the victim**



## *Autopsy Procedures*



*Who Am I? (Who was I?)*



# *Autopsy*

## **Steps Involved:**

### *1. External Examination*

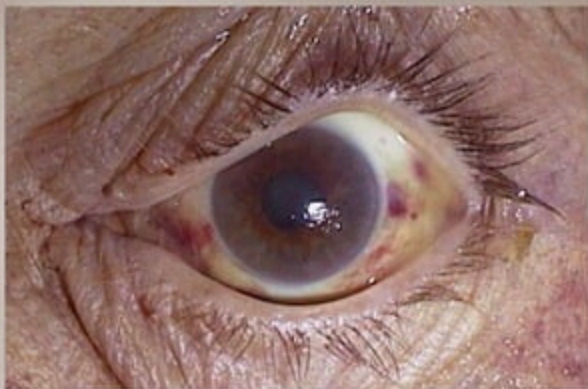
- a. measurements - length, weight*
- b. inspection of external surface for injury, discoloration, “cause of death”*

*signs*

### *2. Opening of Trunk*

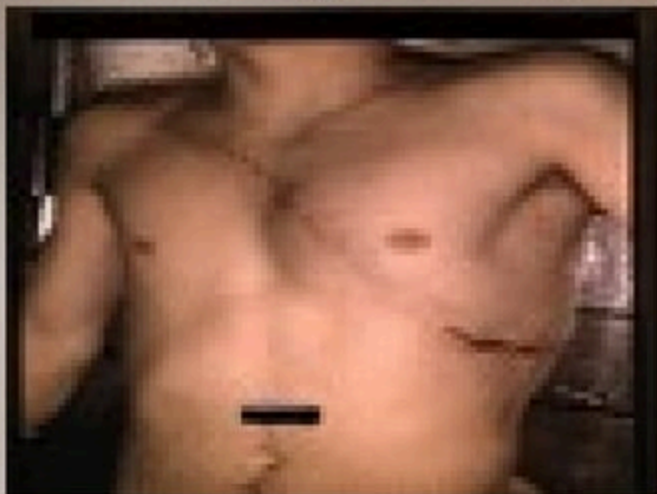
- a. ‘Y’ incision*
- b. Open rib cage*
- c. Condition of heart*
- d. Remove organs*

## *“Cause of Death”*



**Petechial hemorrhage as a result of strangulation**

## *“Cause of Death”*



**Discoloration or bruising is noted and often hints at a “cause of death” diagnosis**



# *Autopsy*

## **Steps Involved:**

### *1. External Examination*

*a. measurements - length, weight*

*b. inspection of external surface*

### *2. Opening of Trunk*

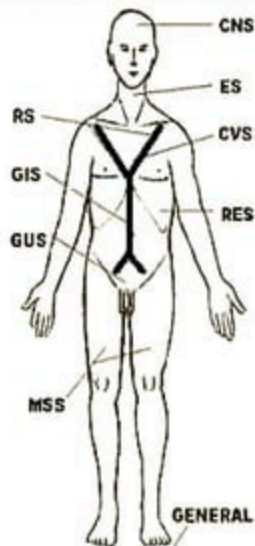
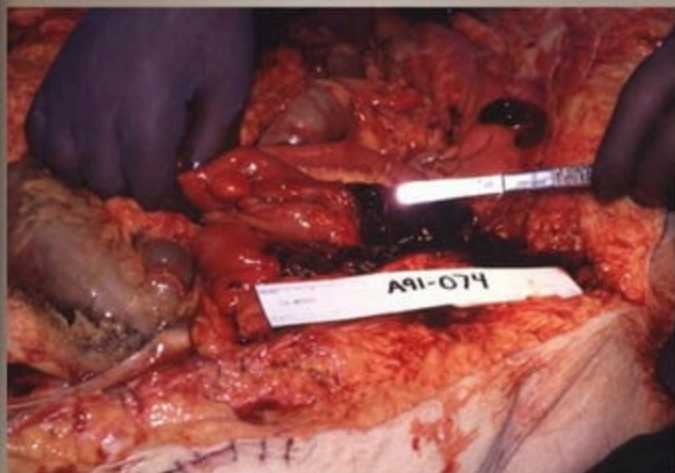
*a. 'Y' incision*

*b. Open rib cage*

*c. Condition of heart*

*d. Remove organs*

# Autopsy



**Y incision**

# *Autopsy*

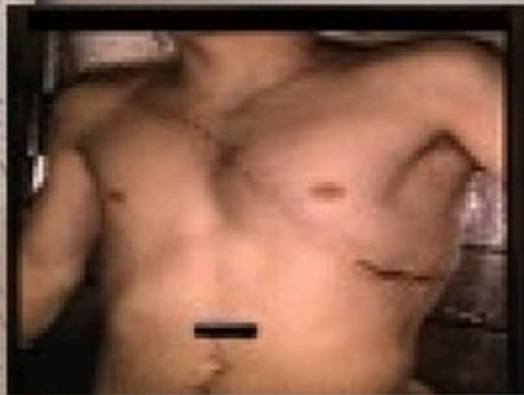
## **2d. Remove Organs:**

- **must cut ligaments holding organs in the body cavity and through the trachea and rectum**
- **transfer organ block to a dissecting table**
- **examine organs in proper order (weigh, physical exam in and out, take tissue samples, save other appropriate samples)**

**heart → liver → spleen → kidneys → pancreas  
→ bladder → genitalia → complete G.I. tract**

- **save postage stamp sized amount of tissue**
- **examine tissue under a microscope for bacteria, disease**

## *“Cause of Death”*



# *Autopsy*

## **Steps Involved:**

### *3. Remove brain*

*cut around cranium using "Stryker saw"*

*store for 2 weeks in 10% formaldehyde*

### *4. Closing*