Death: Meaning, Manner, Mechanism, Cause and Time

What does DEATH mean??

There is no single “accepted” definition of death

- irreversible cessation of circulation of blood
- heart stops beating and cannot be restarted
- cessation of brain activity
- Death is a **PROCESS** rather than an instant event.
- Typically, the moment of death is usually considered to be **THE POINT OF NO RETURN**

- **First Stage = STOPPAGE**
  - Heart stops beating
  - Cells of body begin to die
  - Body processes fail
  - Nerves, muscles, organs stop working
- **Second Stage = AUTOLYSIS**
  - Cell breakdown
  - Cell membrane dissolves, enzymes and cell contents spill out

In cases of **SUSPICIOUS** or **UNNATURAL** death, a forensic pathologist conducts an examination on the deceased known as an **AUTOPSY**.

II. Manner of Death

The five ways a person can die are:

1) NATURAL
2) ACCIDENTAL
3) SUICIDAL
4) HOMICIDE
5) UNDETERMINED

III. Cause and Mechanism of Death

- The reason someone dies is called the CAUSE OF DEATH
- The MANNER of death describes the specific change in the body that brought about the cessation of life

Ex: Cause of Death: Shooting

Mechanism of Death: LOSS OF BLOOD

Cause of Death: Heart Attack

Mechanism of Death: PULMONARY ARREST

IV. Time Of Death

A. Livor Mortis: means **DEATH COLOR**

- As the body begins to decompose, blood seeps down through the tissues and settles into the lower parts of the body
- red blood cells **BREAK DOWN**, spilling their contents
- hemoglobin turns **PURPLE** when it spills out of the cells

The pooling of blood in the body is known as **LIVIDITY**.

Provides a clue as to how long the person has been dead.

-Begins 2 hours after death and becomes permanent after 8 hours

- During this time, if the skin is pressed, the color will disappear.

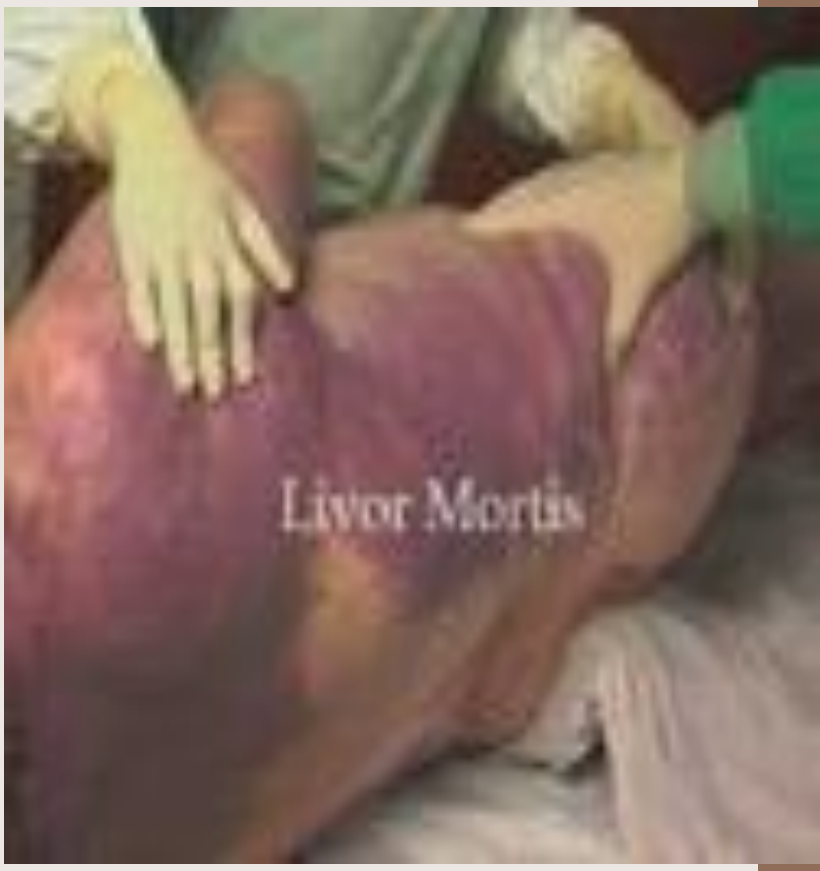
-After this time, the lividity will remain.

** **TEMPERATURE** at which a person dies impacts the time it will take for lividity to set in

-hot day: lividity occurs **FASTER**

-cool day: lividity occurs **SLOWER**

Can also be affected by anything impending the flow of blood, such as **A WATCH** and **BELTS**.



Other Clues:

1)POSITION of corpse in first eight hours

2)Whether or not a person has been **MOVED**

- **DUAL** lividity = a corpse has been moved twice within the first 8 hours of death

B. Rigor Mortis

MEANS: **DEATH STIFFNESS**

- - temporary and can be very useful in determining time of death

- stiffness occurs because the **SKELETAL** muscles are unable to relax and hence remain contracted and hard

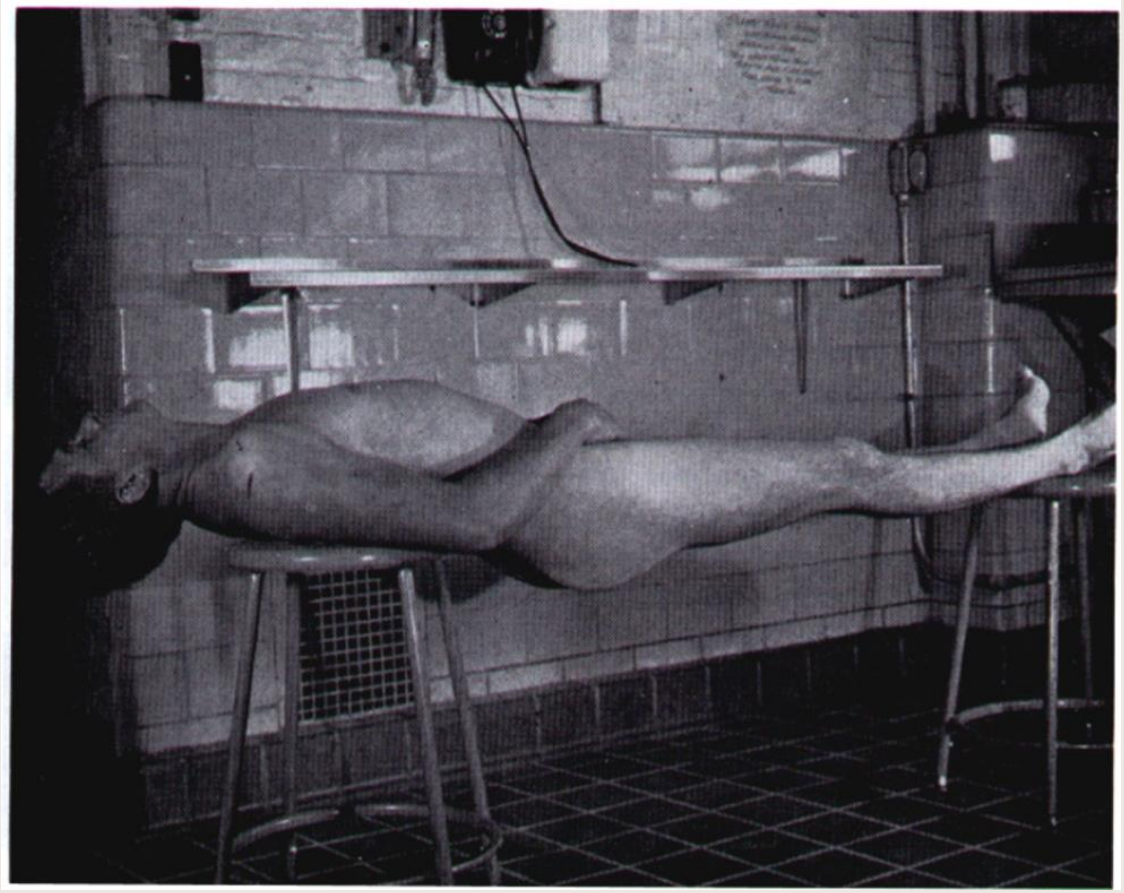
- without oxygen, **CALCIUM** accumulates in these muscles

- Starts within **2** hours after death
- starts in the **HEAD** and gradually works its way down to the **LEGS**
- after **12** hours, the body is in its most rigid state
- The stiffness gradually disappears after **36** hours
- sometimes depending on body weight and temperature, this may last up to **48** hours

Examples:

- If a body shows NO visible rigor, the time of death is LESS THAN 2 HOURS

If a body is extremely rigid, the time of death is ABOUT 12 HOURS



If the body exhibits rigor only in face and neck, the time of death is JUST OVER 2 HOURS

If there is some rigor in the body but a lack of rigor in the face, the time of death is likely ABOUT 15 HOURS AGO

Flexed position of legs indicate body was moved and dumped

Factors that affect rigor mortis

1) Ambient temperature (cold = **SLOWS** rigor)
2) Weight of the body (obesity = **SLOWS** rigor)
3) **CLOTHING** on body
4) **ILLNESS** at time of death
5) Level of **PHYSICAL** activity at time of death
6) **SUN** Exposure (**INCREASES** onset)

C. Algor Mortis: means **DEATH HEAT**

- It describes **THE TEMPERATURE LOSS** in a corpse
- To take a corpse's temperature, a thermometer is inserted into the **LIVER**(standard)

- normal body temperature is **98.6˚ F (37˚ C)**

How fast a corpse loses heat has been measured experimentally:

Approximately one hour after death, the body cools at a rate of **1.4° F** per hour

After the first 12 hours, the body loses heat at a rate of **0.7° F** per hour until the body reaches the same temperature as its surroundings.

D. Stomach and Intestinal Contents

- In general, it takes **4 to 6** hours for the stomach to empty its contents into the small intestine
- it takes another **12** hours for the food to leave the small intestine
- it takes **24** hours from when a meal was eaten until all the undigested food is released from the large intestine.

Determine Time of Death —*Stomach and Intestinal Contents*

Example –

Determine the time of death from the last meal if food is found in the small intestine

Answer: Death occurred 4 - 6 hours after the last meal

E. Changes of the Eye following Death

1) Following death, the eye **DRIES OUT**.

2) A **THIN FILM** is observed within 2-3 hours if eyes were **OPEN** at death and within 24 hours if eyes were **CLOSED** at death.

3) The buildup of **POTASSIUM** may also be used to estimate time of death

F. *Stages of Decomposition*

- **Within 2 days**
  - Cell **AUTOLYSIS** begins
  - **GREEN** and **PURPLISH** staining from blood decomposition.
  - Skin takes on a **MARBLING** appearance
- **After 4 days**
  - The skin **BLISTERS**.
  - The abdomen **SWELLS**.
- **Within 6-10 days.**
  - The **CORPSE** bloats.
  - Fluids begin to **LEAK** from body openings as cell membranes rupture.
  - The skin **SLOUGHS** off.
  - Eyeballs and other tissues **LIQUEFY**.

G. Insects

- Insects can provide detailed information about the time of death – this is called forensic **ENTOMOLOGY**.

- At a crime scene, the examiner will observe and record data about environmental conditions, including **TEMPERATURE**, **MOISTURE** and **WIND**.

- Insect evidence
  - within minutes of a death, certain insects will arrive to lay their eggs on the warm body
- common example = **BLOWFLIES**

As a corpse progresses through the stages of decomposition, the initial insects will progress through different stages; other insects will begin to arrive

- Wasps
- Beetles
- Moths
- Ants