



# Death and Decomposition

**"Mortui vivos docent –  
The dead teach the living."**

# Stages of Death

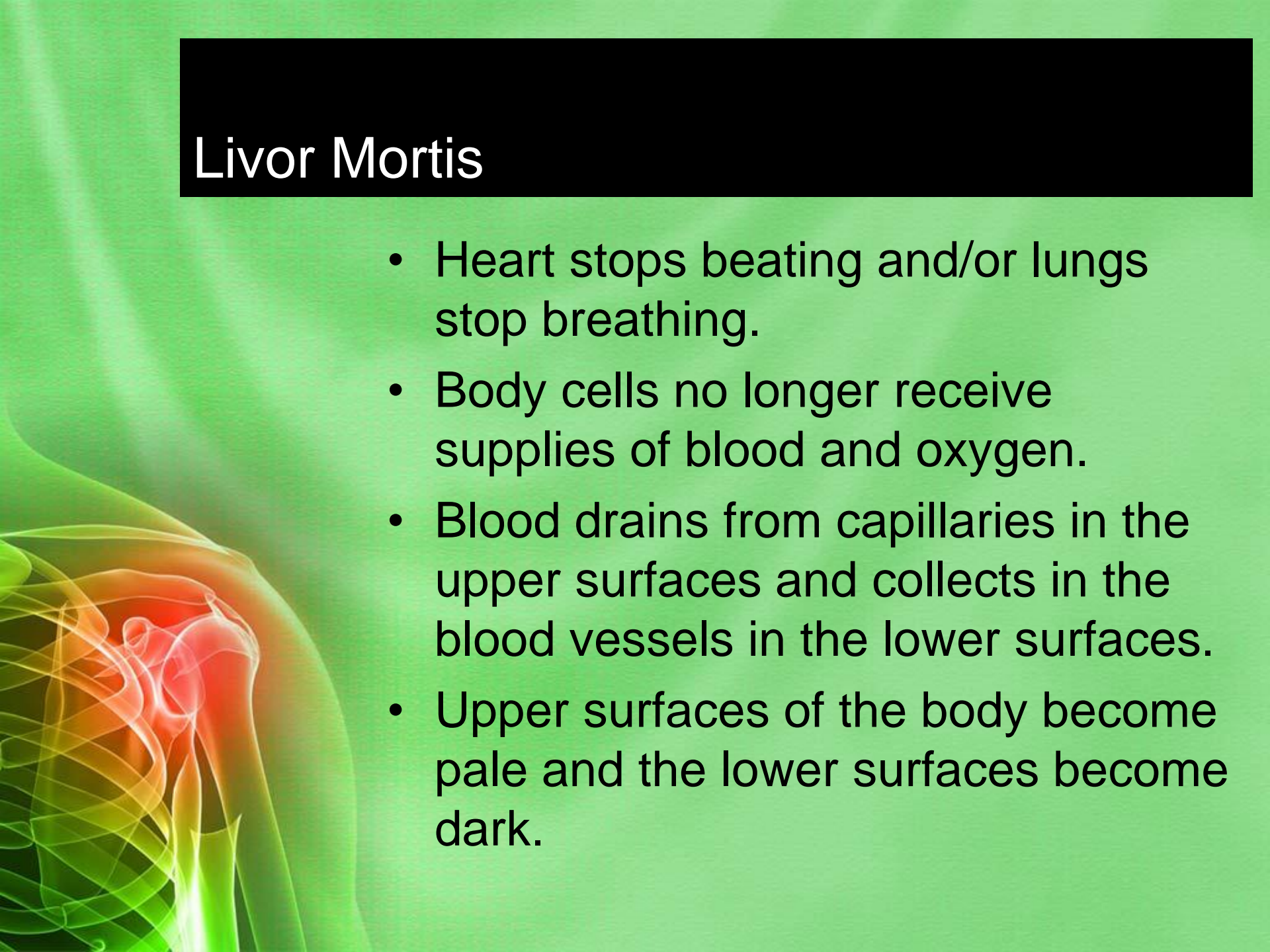
- There are basically two stages of death:
  - Somatic
    - When vital bodily process stop (breathing, digestion, energy production, heart beat)
  - Molecular
    - Breakdown of the body (decomposition)





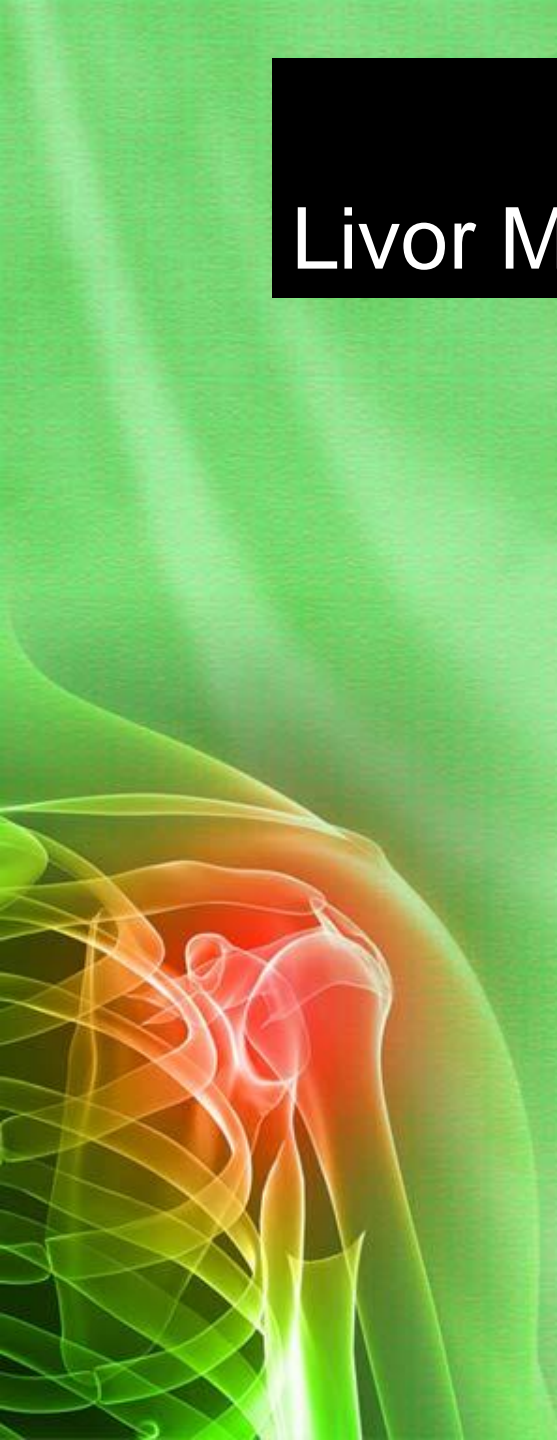
# Livor Mortis

- Heart stops beating and/or lungs stop breathing.
- Body cells no longer receive supplies of blood and oxygen.
- Blood drains from capillaries in the upper surfaces and collects in the blood vessels in the lower surfaces.
- Upper surfaces of the body become pale and the lower surfaces become dark.



# Livor Mortis

- Discoloration - *Livor*
- Red blood cells - *Mortis*
- Lividity appears in hues of red
- Cherry red = CO poisoning
- Maroon is normal
- If lividity appears on the front but the corpse is on its back = the corpse was moved PM.
- The **lividity** will “pattern”, based on if the body is lying on an object.
  - Ex. tire iron or rocks



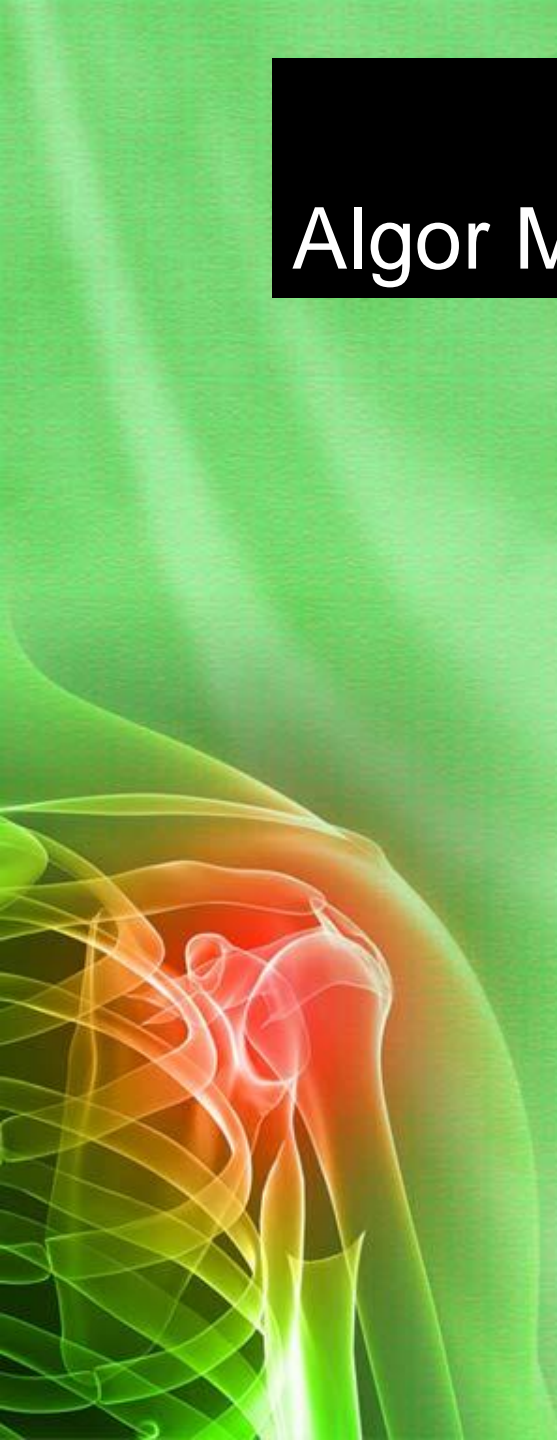


# Livor Mortis...Areas of Pressure?



# Algor Mortis

- Rate at which a body cools after death.
- A body cools very little during the first hour PM.
- After the first hour to about six hours, a body will generally cool at the rate of  $1.5^{\circ}$  F for each hour after death.
- Under normal conditions, a temperature of  $95.6^{\circ}$  indicates the body has cooled  $3^{\circ}$  from normal ( $98.6^{\circ}$ ) and has likely been dead 2-3 hours.





# Algor Mortis

- The most accurate means for taking body temp is internally (rectal).
- At a scene, they use the liver.
- This reading is accomplished by inserting a meat thermometer into the body just under the rib cage on the right side.
- In most cases, a person has been dead for so long that the body temperature may be so low as to be irrelevant.



# Algor Mortis

- The preferred time window for evaluating algor mortis is within the first several hours after death.
- Beyond that, the rate of cooling becomes less and less accurate as the body temperature approaches equilibrium with that of its environment.





# Algor Mortis Problems

- Body temperature is easily affected by
  - Age
  - Weight
  - Illness
  - Conditions of the environment (temperature, clothing, surface, activity prior to death).



# Algor Mortis Problems

- Temperatures can also increase due to physiology or environment.
- Someone who dies with a high fever has a higher plateau from which to cool and will subsequently give a higher reading.
- Someone who dies in a heated bedroom will cool more slowly than someone in an unheated garage.





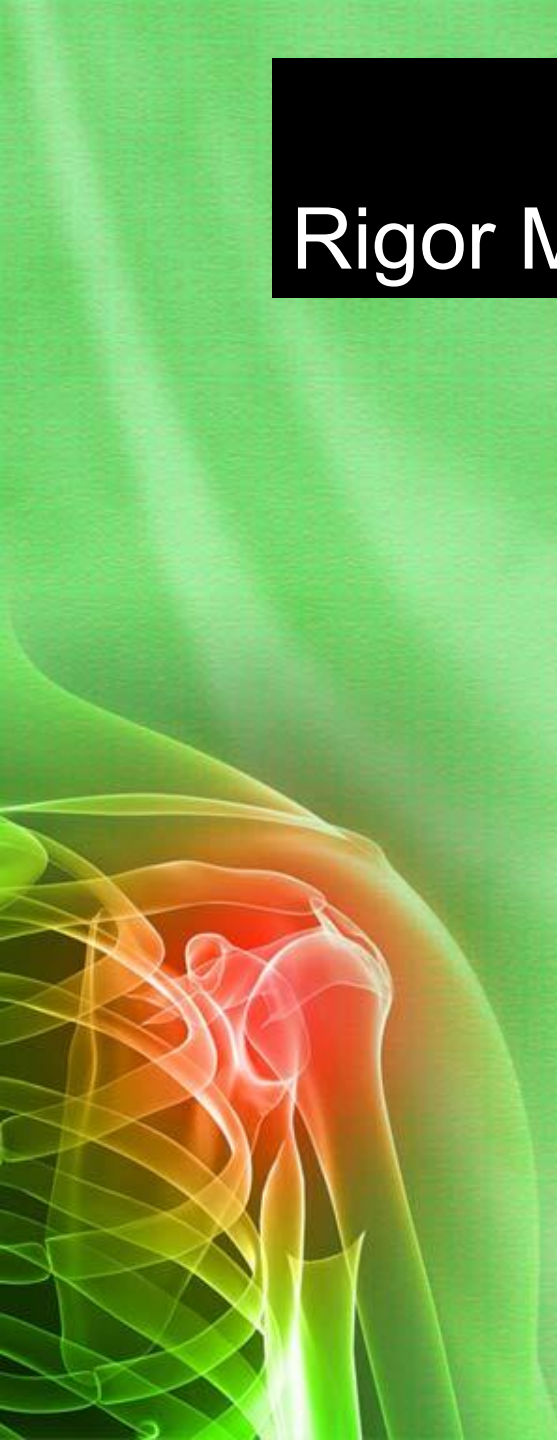
# Rigor Mortis

- Stiffening is called *rigor mortis*.
- Depending on temperature and other conditions, rigor mortis lasts approximately 72 hours.



# Rigor Mortis...How it Works

- Normal living muscle cells use energy (in the form of ATP) to move Ca out of the cells.
- At death, your ATP reserves are used up quickly and Ca can't get shipped out the cell...it builds up inside.
- The Ca build-up causes ACTIN and MYOSCIN (muscle fibers) to link and stay linked.





# Rigor Mortis...Timeline

- Range from 10 min to several hrs.
- Maximum stiffness is reached around 12-24 hours post mortem.
- Facial muscles are affected first, with the rigor then spreading to other parts of the body.
- It is interesting to note that meat is generally considered to be more tender if it is eaten after rigor mortis has passed.





# The Body Farm...





# Anthropology Research Facility at the University of Tennessee

- One research study examined the effects of the elevated temperatures—and the limited insect access—to which a body in a car would be subjected.



# Body Farm...

- Corpse 1-81 was an elderly white male; he became part of a pioneering study of insect activity in human corpses.





- After only a few weeks in the Tennessee summer, the skull is completely bare and many of the vertebrae are exposed. The rib cage and part of the pelvis are covered with dried, leathery skin.





- Close-up of a human femur and hip bone, containing an artificial hip implant. Such orthopedic devices can help identify an unknown crime victim.





- Aerial view from Patricia Cornwell's helicopter.



# National Geo Body Farm Video

