

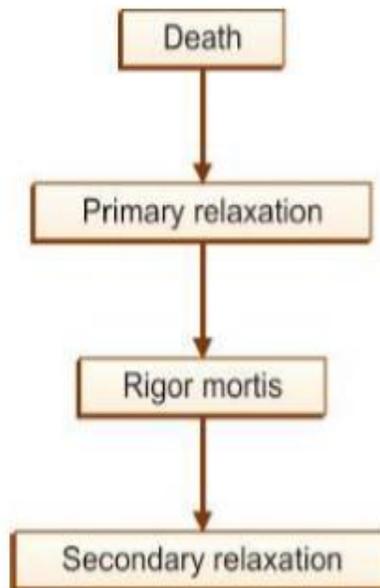
FORENSIC SCIENCE  
VI SEMESTER

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**CHANGES IN MUSCLE**

After death, three sort of changes are identified in the muscles and these changes are as follows .

- 1.Primary relaxation or primary flaccidity of muscles
2. Rigor mortis
3. Secondary relaxation or secondary flaccidity of muscles



**FIG. 7.17:** Changes in muscles after death

## **Primary Relaxation**

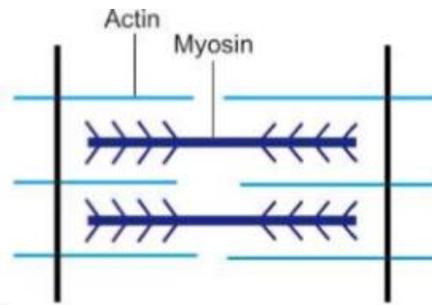
- This state of muscle begins with somatic death and in this phase molecular death does not occur.
- This stage lasts for 1-2 hours.
- All the muscles, voluntary and involuntary, are relaxed after death.
- Since the molecular death has not occurred, the muscles may respond to mechanical, electrical or chemical stimuli.
- In this stage, the muscle reaction is alkaline and the anaerobic activity in cells may continue.

## **Rigor Mortis**

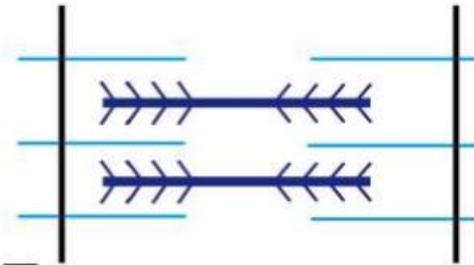
Synonyms: Cadaveric rigidity (rigor = rigidity, mortis = of death)

**Definition** Rigor mortis is that state of muscles of dead body where they become stiff with some degree of shortening that follows the period of primary flaccidity.

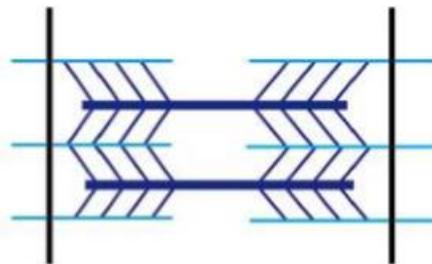
Rigor mortis is the stiffening of muscle after death. Along with stiffening of muscle, shortening of muscle fibers, albeit small, have been noted. When rigor mortis is developed completely, the body and joints become stiff with flexion attitude of upper limb muscles. Appearance of rigor mortis indicates death of individual cells (i.e. molecular death has occurred).



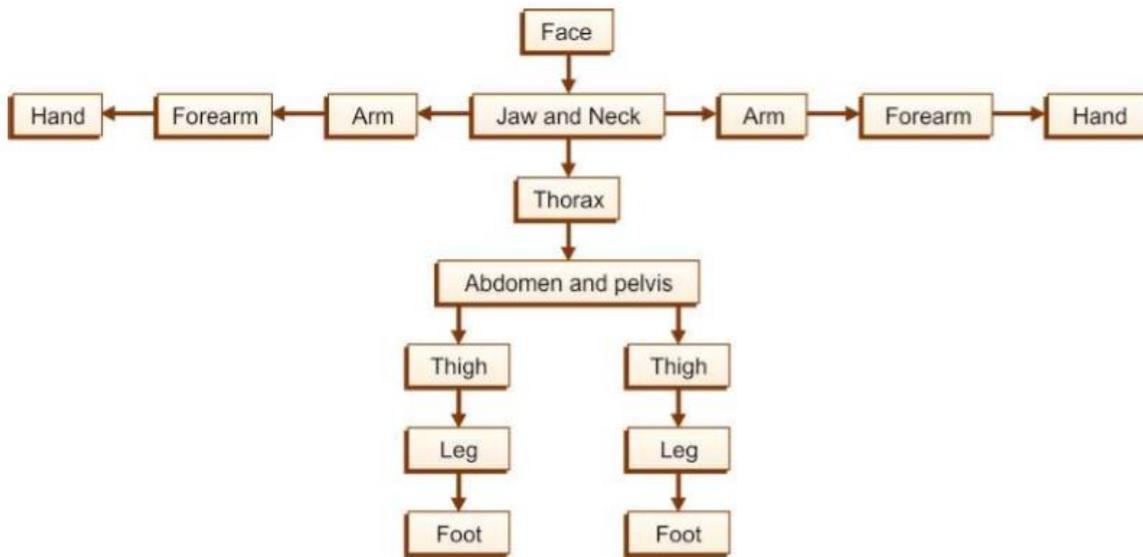
**A** Contracted muscle



**B** Relaxed muscle



**C** Rigor mortis



**FIG. 7.20:** Appearance of rigor mortis

**Factors Appearance of rigor mortis depends on many factors such as:**

1. **Age** – it does not occur in fetus less than 7 months of intrauterine life, however, a case was reported in Modi’s Textbook of Medical Jurisprudence that rigor mortis was recorded in 5 month fetus at Bombay famine hospital.
2. **Physique of the person** – rigor mortis appear early and passes off early in thin built subjects with weak musculature in comparison with well-built people.
3. **Season** – in summer season with high atmospheric temperature, rigor mortis appear early and passes off early in comparison with winter season with low environmental temperature.
4. **Cause of death** – rigor may appear early and passes off early in deaths preceded by high muscular activity causing considerable depletion of glycogen storage in muscle whereas in certain conditions the onset is delayed. In certain deaths, it appears early but stays longer.
5. **Condition of muscles before death** – if the muscles are relaxed, then rigor sets late. If the muscles are exhausted then rigor mortis set early and passes-off early.

## **Medicolegal Importance**

1. Presence of rigor mortis is sign of death
2. Time since death can be estimated
3. Indicates position of the body
4. Rigor mortis may be confused with cadaveric spasm, heat stiffening, cold stiffening
5. Breaking of rigor mortis – due to handling of the body or when force is used, the stiff joints may get loosened with breaking of rigor mortis. When breaking of rigor mortis occur in this fashion then the muscles do not resume rigor again. Such picture may cause difficulty in estimating time since death.
6. Rigor mortis is not functionally related with the nervous system, and therefore it is also developed in paralyzed limb.