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**NEVADA COUNTY  
SHERIFF'S OFFICE**



**CORONER'S DIRECTIVE**

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**Effective Date ~~05/30/99~~  
2/6/18**

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**SUBJECT** ESTIMATING TIME OF DEATH AND SIGNS OF DEATH

**POLICY** The deputy coroner must estimate the time and signs of death according to certain physical evidence at the scene and inspection

**PURPOSE** To provide the deputy coroner with information basic to understanding the signs of death and estimating the time of death

**CODE REFERENCE** Government Code §27491.1

**CASE LAW**

**DEFINITIONS**

**PROCEDURE**

A. Estimating Time of Death

1. Whenever a dead body is subject to a coroner's investigation, one of the things the coroner is required to do by statute is to state the date and time of death. This is one area that, in most cases, requires an efficient on-scene investigation. An examination of the body and an inquiry is required by the investigating deputy coroner. This information is necessary in order to establish a *corpus delicti*, to place a suspect at the scene at a given time, and to corroborate or to disprove an alibi; but there could be serious rights of the deceased or his estate violated by loss of death benefits or benefits not entitled to the estate as to insurance and inheritance. Should an improper investigation occur, the coroner could be civilly liable.
2. In the absence of an eye-witness to the actual death, the investigator may estimate the approximate time of death by interpreting the physical evidence found in or about the scene, and by inspecting the body for various physiological changes that normally occur after death. However, it is important for the investigator to recognize that findings obtained in this manner only indicate the approximate time of death. One must therefore regard one's deductions as investigative aids.

B. Physical Evidence and Inquiries

1. The examination of the death scene, coupled with inquiries regarding the habits of the deceased and of particular events occurring prior to and after the time of death, usually provides one of the more accurate methods of estimating the time of death. Typical of the physical evidence that may be used to estimate the period of time that has elapsed between the occurrence of death and the discovery of the body is as follows:
  - a. A broken wristwatch stopped at a particular time;
  - b. The accumulation of mail and/or newspapers;
  - c. The presence of food on the table, or a meal in the process of preparation;
  - d. Bills, letters, or other dated correspondence found on the body;
  - e. Whether the lights are turned on or off

The absence of some evidence may also be as significant as its presence.

2. A friend, relative, and/or neighbor familiar with the personal habits of the deceased may be of assistance. Thus, the omission of certain acts that were part of a daily routine may indicate the death occurred before the performance of these activities:
  - a. Failure to answer the telephone, doorbell, or to visit a friend;
  - b. Window shades or blinds drawn in the daytime;
  - c. Lights left burning after a particular hour;
  - d. Unexplained absence from work, the club, favorite bar, or other gathering;
  - e. Not seen taking a customary walk or leaving or returning from work at the usual time

The above are all examples of the type of information that may be supplied by someone familiar with the habits of the deceased.

3. Articles foreign to the death scene, or that are associated with a particular time will also help the investigator estimate the time of death.  
For example:

- a. Mud or water stains on the floor;
  - b. The absence of footprints in the snow or on a rain-saturated ground;
  - c. Dry ground under a body discovered during, or immediately following, a severe rain or heavy snowfall
4. Witnesses may also be interviewed to determine the time the victim was last seen alive.
  5. Experienced investigators have found the answers to such inquiries must be carefully weighed due to the inability of some persons to completely recall past events or to estimate time; but when this information is sustained by physical evidence and the findings of the pathologist, the investigating officer can validly estimate the time of death.

C. Signs of Death

1. Death is described as follows in the Uniform Determination of Death Act:

An individual who has sustained either:

- a. Irreversible cessation of circulatory and respiratory functions, or
  - b. Irreversible cessation of all functions of the entire brain, including the brain stem, is dead.
2. Death is said to occur when the vital functions of breathing and circulation cease, and are accompanied by a combination of observable changes in body tissue, muscular flaccidity, changes in the skin or eyes, coldness of the body, post-mortem lividity, rigor mortis, and putrefaction. The extent and intensity of these physiological changes serve as a measure to estimate the approximate time of death.
  3. Body Changes
    - a. A dead body will usually have a general pallor to the skin.
    - b. The normal reddish color of the lips and nails disappear as soon as circulation stops or is deficient.
    - c. There is a general relaxing of the muscles (flaccidity) causing the body to conform to the contour of the surface upon which it lies.
    - d. There is pronounced limpness to the extremities. When the body is moved, the head has a tendency to dangle leading the inexperienced to

believe that the neck is broken.

- e. Muscle control of the bladder and bowels disappears and the contents may escape from the body.
- f. *Cutis anserine*, or goose pimples, are formed on the skin. This condition is more pronounced on bodies removed from water or cool places. This condition usually remains for about 24 hours, but has also been known to persist for days.

#### 4. Changes in the Eyes

- a. The eyelids remain open if they are separated.
- b. The pupils may become irregular in shape and unequal in size due to the loss of muscular control.
- c. The eyes also reflect the general loss of body moisture that accompanies death. If the eyelids are open, the drying of the eye surface becomes more pronounced and is distinguished by a thin opaque film over the eyeballs. This is usually observable within an hour after death depending upon the moisture in the atmosphere.
- d. The eyeballs lose their firmness and tend to sink into their sockets. Later, the white of the eye after drying becomes yellowish or reddish-brown in color.

#### 5. Body Temperature

- a. Loss of body heat need not occur after death as the dead body tends to assume the environmental temperature; but as heat is exchanged from the surface of the skin to the environment, it may generally be stated that body temperature will be lower after death. Normally, a body will feel cold to the touch eight to 12 hours after death, and will generally attain the temperature of the surrounding air after approximately 24 hours.
- b. The rate of body heat loss will depend upon several factors:
  - (1) Environmental Factors: The greater the difference between body temperature and the environment (air or water temperature), the faster the heat loss from the body. Thus, the rate of body heat loss is slower when the temperature of the body nears the environmental temperature. The intensity and quality of air movement and the temperatures of the surfaces touching the body will also affect the rate of body heat loss.

(2) The Temperature of the Body Before Death: Deaths resulting from

strokes, brain injury, strangulation, or sunstroke, are usually preceded by a brief rise of body temperature. This condition will affect the rate of body cooling and the determination of the time death occurred.

- (3) Insulation of and over the Body: Body fat, the amount of flesh covering the body, or the amount of clothing worn at the time of death will affect the rate of temperature change after death.

## 6. Check the Body Temperature

The temperature of a dead body should be noted even though a number of variables affect the rate of body heat loss after death. Usually, touching the neck area or under the armpits will determine if the body is still warm. If the body feels warm, it may indicate death occurred within a matter of hours. Whereas, a cold, clammy body, found indoors at room temperature, may have been dead for at least 24 hours.

## 7. Postmortem Lividity

- a. When death occurs and the heart ceases to function, the blood, as a result of gravity, settles in the lowest portions of the body. A purplish discoloration known as a lividity stain appears on the skin of the body areas nearest to the surfaces on which the body is lying. However, Lividity will not appear on the portion of the body in firm contact with the floor, or on a supporting surface as the blood vessels in these areas are compressed and prevent blood from entering and staining the body tissue. Those portions of the body compressed by a constricting object, such as a noose or tight clothing, will also be free of lividity stains.
- b. Although the lividity stains are normally reddish-blue (purple) in color, one may find, in some types of death, the discoloration will be of a different hue. In cases of carbon monoxide and cyanide poisoning, the lividity stains are light red in color. Whereas, in deaths caused by potassium chlorate poisoning, the lividity stains are light brown in color. Lividity stains retain their color until the onset of putrefaction, at which time they will appear brownish in color.

- (1) Postmortem lividity may appear as early as one-half hour after death and become highly pronounced after four hours. After lividity is fully developed and the blood has clotted, the staining of the tissue will remain even though the position of the body may be changed. Thus, if a body is found with lividity marks on the upper surface, it is reasonable to assume the body has been moved after death.

- (2) On the other hand, if the body is moved when the blood is still fluid, the marks will change. A change in the body's position within a period of approximately three to four hours after death may cause the original livid stains to partially disappear and new ones to be formed. After 12

hours, new livid stains will not be produced; the old marks will remain if the body is moved and its position changed.

#### 8. Lividity or Bruise

An inexperienced officer might confuse a bruise to represent a lividity stain; the difference between these two marks may be determined in the following manner:

- a. A bruise may have a swelling or abrasion whereas lividity does not.
- b. The coloring of bruises may vary (black, blue, yellowish-green, et cetera) whereas livid stains remain uniform.
- c. Bruises may appear on numerous parts of the body while lividity only appears on the lower parts of the body unless, of course, the body was moved before the blood had completely clotted.

If the differentiation cannot be made at the scene, an autopsy will provide positive answers.

#### 9. Rigor Mortis

Chemical changes occur within the body when the vital functions cease. Initially the muscle tissue loses its firmness and becomes soft and pliable. This general muscular relaxation (flaccidity) prevails until rigor mortis sets in. Rigor Mortis is a general stiffening of the body caused by a breakdown of enzymes and the accumulation of acid in the muscle tissue. This condition may be noticed three to six hours after death and will persist for approximately 12 hours after full development.

##### a. Factors Affecting Rigor Mortis

Numerous factors affect the initial appearance of rigor mortis, the rapidity in which it spreads, and the length of time it remains. Postmortem rigidity is more likely to appear more rapidly and be pronounced when death is caused by either of the following:

- (1) Injury to the central nervous system, heat stroke, lightning, carbon monoxide or strychnine poisoning, and burning. Extreme muscular exertion immediately before death will hasten the setting of rigor mortis in those muscle groups that were used.
- (2) The development of rigidity is also rapid in the bodies of children and weakened or emaciated persons; it is retarded in heavily muscled body. Lower temperature will accelerate the development of rigor mortis, but on the other hand, it retards its disappearance. In situations that may be termed "average" (normal room temperature of 60-70 degrees Fahrenheit), medium body build, and when the victim was engaged in little or no activity at the time of death, rigidity may be initially observed in about four hours, and will develop throughout the whole body in approximately ten hours.

(3) Rigidity gradually spreads throughout the body beginning in the facial muscles (jaw in three to four hours). It then extends to the neck, fingers, wrists, elbows, shoulders, knees, hip, and finally the abdomen. It then recedes in the same order as it appeared. Bodies of emaciated persons and infants will show relatively rapid loss of rigidity. Usually the traces of rigor mortis disappear after 24 hours; the body once again becomes relaxed and will remain in this relaxed state until frozen or embalmed.

b. Cadaveric Spasm

In those deaths marked by severe injury to the central nervous system or emotional and muscular tension, an immediate stiffening of the arms or hands may occur at the time of death. This condition, known as cadaveric spasm, may be confused with rigor mortis; however, the experienced investigator knows rigidity caused by rigor mortis would be present in the jaw and neck muscles.

10. Putrefaction

- a. The decomposition of a body occurs at various times in the interval following death. Its appearance will vary with the type of decomposition and environmental factors.
- b. During life, the bacterial activity within the body is kept under control. At death, these controls disappear and putrefaction may start and progress, usually in the intestinal tract or on diseased portions of the body. The rate of putrefaction is primarily determined by the environmental temperature. The warmer the surroundings, the more rapid the putrefaction.
- c. The first signs of decomposition usually appear in the lower abdomen and external genitals as a greenish discoloration. As the process advances, the skin darkens to the point it is difficult to determine the original color of the decedent's skin.
- d. In the early stages, putrefaction will progress more rapidly in the areas where lividity is present. Surface blood vessels appear as greenish-brown streaks. Bacterial action produces a gas that causes swelling while an unpleasant odor becomes noticeable. Liquid and gas blisters appear on the skin and gradually turn black. The stomach contents may be forced up through the mouth and the fetal sac may drop from a pregnant uterus.
- e. Due to the many variables affecting the rate of putrefaction, it is extremely difficult to estimate the time of death from the state of putrefaction. However, bodies found in water will show certain changes, which under certain conditions, may help the investigator. If the water is slightly warm, these conditions may be observed:

(1) 2 to 4 hours – skin of fingers and toes nearly white or wrinkled;

- (2) 24 to 48 hours – this change spreads to the hands and soles of the feet;
- (3) 1 week – outer layer of skin separates from the deeper layer;
- (4) 2 to 3 weeks – the skin and nails separate from the body.