

# Time Since Death

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Forensic Science

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- Forensic science provides a number of solutions to solving the mystery question of when a person died. Generally, the longer it has been since the death, the less accurate the estimation given by forensic pathologists.

# Body Temperature

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- Police arriving at the scene of crime should be capable of estimating how long a person has been dead for, by judging from the body temperature and stiffness of the corpse. However, a more accurate evaluation of the time since death must be made by a forensic pathologist in the forensic laboratory. The pathologists/coroners record the temperature of the body, the temperature at the scene of crime, the weight of the victim and all other appropriate variables, which are then applied to a formula designed to predict the time since death. The core body temperature drops at an estimated rate of  $0.8K$  each hour from the time of death, but is ever-changing dependant the surrounding temperature, humidity levels, air movement and fat levels in the body. Thus, the less time that has surpassed since the death, the less variables which will affect the prediction.

# Hardening

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- Stiffening of the corpse occurs between just 30 minutes and 3 hours after death. The process is called rigor mortis and occurs as the muscles in the body begin to stiffen from a lack of blood and oxygen. Rigor mortis first becomes apparent in the eyelids and jaws of the victim and spreads throughout the whole body in approximately 6 to 12 hours, before receding again after another 6 to 12 hours. Occasionally, stiffening of the body may not even occur if the surrounding temperatures are very low, while the process occurs a lot quicker in muscles that were quite active before death. Like body temperature, the evidence provided by the level of muscle stiffening becomes of little use after a long period since death.

# Truth Lies In The Eyes

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- The eyes of a victim can also hold answers to the time of death, as a thin cloudy film is developed over the eye within 3 hours after death has occurred. The eyeballs become softer as a result of less fluid pressure behind the eye and the degree to which this has occurred can be used as a measure of the time since death. Again, a less common procedure for deaths that evidently occurred out of the limit of several days.

# Skin Color

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- The color of the corpse will also help determine the time of death from about 48 hours and onwards. From approximately 48 hours after death, bacteria begins to breed on the skin, giving the skin an evidently greenish tone. The tinge starts in the lower stomach area, spreading outwards and affecting the hands and feet last. Approximately 4-7 days after death, the skin will acquire a marble-like appearance, as the veins in the body become closer to the surface, thus becoming more easily visible.

# Blood Pooling

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- **The pooling of the blood can be a vital clue in determining the time of death and is known as hypostasis. This occurs when the blood ceases flowing, settling in the lowest parts of the body and in turn, causing the skin to become pink and red in color. This process is complete in up to 6 hours after death. The main use of blood pooling analysis actually lies in helping to determine the death manner (noting that the location of the blood pools indicates the upright position of the body at the time of blood pooling) The process does however, form a method of predicting the time since death.**

# The Digestive System

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- The digestive system and gut contents of a victim can provide important clues to the time of death of a victim. Chewed food will firstly pass through the esophagus and then down into the stomach within seconds of the initial swallowing. After 3 hours, the food then leaves the stomach and heads toward the small intestines. 6 hours after eating a meal, the food will have traveled half way through the small intestines and begin moving through the large intestine. Where the victim's small intestine is empty, it suggests that the victim ate his or her last meal approximately 8 hours before death. The digestive process usually takes a bit more than a day, but it can be affected by sickness, liquid intake, fear or drug intake.



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- Pathologists also briefly note that correct level of food digestion corresponds to its location in the digestive system. In the rare case that a clever murderer wishes to delude investigators by attempting to bring forward the time of the victim's last meal (giving them an explanation for where they were at the victim's time of death), he/she may manually feed processed food (resembling that of chewed food) into the victim's stomach. If this is so, the food collected in the stomach will be much less digested than normal, since the periodic motion of the stomach stops after death. The food may indeed appear slightly broken down, due to the presence of the stomach acids, but any abnormalities are otherwise detectable. In older people or in those affected by the effects mentioned earlier (sickness, fear, drug/liquid intake), the efficiency of food digestion alters and it is left to pathologists to determine if the extent of the undigested food is great enough to suggest the mentioned scenario.

# The Body Farm

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- Decay can also determine how long a person has been dead for and in Tennessee, a special research area has been set up to study exactly how and why bodies decay. The research farm, known as The Body Farm, was established in 1981 by Bill Bass, a professor of forensic anthropology. By having decaying bodies readily available to study, Bass and his students discovered a number of factors contributing to body decay. Some things they discovered include that flies and maggots will turn a body in to a skeleton in under two weeks in warmer weather and the face will always rot first because maggots prefer wet places. He has also observed how fast bodies decay when submerged in water, stored in the boot of a car, or wrapped in plastic and that when a person's head is burnt, that the skull reaches boiling point very quickly, causing the skull to explode. If the person head doesn't explode, it means that the victim may have been shot in the head, allowing the steam to escape.