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# Time of Death Determination in Medicolegal Death Investigations

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**Abstract :** Medicolegal death investigation historically is a field that does not receive much research attention or advancement, as all of the subjects are deceased. Public health threats, drug epidemics and contagious diseases are typically recognized in decedents first, with thorough and accurate death investigations able to assist in epidemiology research and prevention programs. One vital component of medicolegal death investigation is determining the decedent's time of death. An accurate time of death can assist in corroborating alibies, determining sequence of death in multiple casualty circumstances and provide vital facts in civil situations. Popular television portrays an unrealistic forensic ability to provide the exact time of death to the minute for someone found deceased with no witnesses present. The actuality of unattended decedent time of death determination can generally only be narrowed to a 4-6 hour window. In the mid- to late-20th century, liver temperatures were an invasive action taken by death investigators to determine the decedent's core temperature. The core temperature was programmed into an equation to determine an approximate time of death. Due to many inconsistencies with the placement of the thermometer and other variables, the accuracy of the liver temperatures was dispelled and this once common place action lost scientific support. Currently, medicolegal death investigators utilize three major after death or post-mortem changes at a death scene. Many factors are considered in the subjective determination as to the time of death, including the cooling of the decedent, stiffness of the muscles, release of blood internally, clothing, ambient temperature, disease and recent exercise. Current research is utilizing non-invasive hospital grade tympanic thermometers to measure the temperature in the each of the decedent's ears. This tool can be used at the scene and in conjunction with scene indicators may provide a more accurate time of death. The research is significant and important to investigations and can provide an area of accuracy to a historically inaccurate area, considerably improving criminal and civil death investigations. The goal of the research is to provide a scientific basis to unwitnessed deaths, instead of the art that the determination currently is. The research is currently in progress with expected termination in December 2018. There are currently 15 completed case studies with vital information including the ambient temperature, decedent height/weight/sex/age, layers of clothing, found position, if medical intervention occurred and if the death was witnessed. This data will be analyzed with the multiple variables studied and available for presentation in January 2019.

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