



B76 Fire and Death - Working Together to Get the Right Answers

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The goals of this presentation are to correct misunderstandings about fire and present current knowledge as to the character and intensity of the fire environment as a fire develops in a room or building and to emphasize how the interaction of the victim with that environment determines their postmortem condition.

This paper will discuss the reconstruction of a wide variety of fatal fires using current knowledge of the fire process (including the intensity of fires produced by modern materials and the postmortem combustion of remains). Case examples will illustrate the benefits of cooperation between fire investigators, police, fire scientists, medical specialists, and forensic scientists.

Fire is a process that many people take for granted because it has been part of the human experience for so long, but it is in fact so complex that it is only now becoming well understood by fire scientists. While the basic principles are widely known, specifics such as temperatures, intensities, and speed of spread are not appreciated by those involved in its aftermath (especially where modern synthetic furnishings are involved). Fires can be very localized (one chair, one wastebasket) or generalized throughout a room (post-flashover). Similarly, the hot, toxic gaseous products may be localized in a hot gas layer with fresh cool air beneath or may completely fill a room. Videotaped room fires will demonstrate the location and distribution of heat, flames, and smoke as room fires develop under various scenarios. Data will be presented on temperatures and heat fluxes in rooms as well.

When human victims are involved, there are many complications that make the interpretation of physical, clinical, and toxicological evidence very uncertain. Human behavior in fires is not readily predictable and exposure to a "fire" can range from prolonged exposure to cool but toxic smoke to nearly instantaneous death from intense heat or direct flames. To determine whether a fire death is a murder or a tragic accident requires accurate reconstruction of fire events. This requires accurate knowledge of fire chemistry, dynamics, and behavior and appreciation of the effect of fire on subjects – both living and postmortem. Physical evidence such as impression evidence and blood spatter may also play a role in establishing what activities took place prior to death. Case studies will be presented to emphasize the multidisciplinary approach needed to solve the puzzles when fire and death occur.

Fire, Death, Burns