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Smoke and Fire – Understanding the Dangers

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When people talk about smoke and fire dangers, they typically focus on the injuries from intense heat and burns. No doubt, these are essential considerations.

However, you need to give the hazardous nature of both smoke and fire equal consideration.

Experts argue that most injuries and deaths due to fires are a result of smoke inhalation. In any fire, you'll find three significant elements – smoke, oxygen depletion in the environment, and heat. These three elements all interact in various ways, depending on the characteristics of the fire.

Let's explore the possible hazards associated with these various elements of a fire.

Heat

The most obvious danger associated with fire is heat. Although most fire-related deaths result from smoke inhalation, burns from the fire's heat are also significant causes of death.

Anyone in a fire should start feeling the pain once the skin temperature crosses 45ºC.

Inhalation of heated air can also cause internal burns to the vocal cords and upper airways.

Particles – Aerosols and Soot

Aerosols and soot are the most apparent elements of smoke. The type of fire plays a role in the aerosols and chemicals present in smoke, but you are likely to find various chemicals present.

For example, you might encounter nitrogen oxide, benzene, aromatic hydrocarbons, dioxins, and acid gases, depending on what's burning.

All smoke also contains soot or particulate matter, carbon dioxide, and carbon monoxide gases (more on these gases later). Depending on the nature of the fire, these particles can vary in size – from 0.1 µm to above 10 µm (mass median diameter).

One can still find particles larger than 10 µm. These are usually harder to inhale but can even cause problems such as reducing visibility.

The burn temperature and oxygen level of the environment also play a role in the particles and aerosols produced.

Smoke inhalation can lead to various health issues. In the short–term, it can lead to acute eye, throat, and nose irritation. The odor can also be sickening.

Individuals suffering from respiratory and cardiovascular issues may be susceptible to the long-term effects of excessive smoke inhalation.

Long-Term Structural Damage to Your HVAC Unit

No matter how small you think a fire outbreak was, it's wise to get smoke and fire repair experts to take a second look at your HVAC system for any lingering soot and particles.

Ignoring this potential damage could not only damage your HVAC system in the long run, but it could also be injurious to your respiratory system.

Once the fire is under control, get a professional fire damage restoration company to come over to your home. They can evaluate your HVAC system for soot and particles.

Carbon Dioxide Gas

Carbon dioxide (CO2) is a significant danger in any fire. In some fires, it's concentration can climb to extreme levels depending on nature or materials combusting.

When inhaled, carbon dioxide can lead to an abnormal acid-base balance in the pulmonary system.

It can also cause headaches, disorientation, and hyporeflexia. It can also lead to severe neurologic issues such as paralysis, tremors, and deaths in extreme cases.

Carbon Monoxide Gas

Carbon monoxide (CO) is a colorless and odorless gas. The combustion of wood or gasoline produces it.

When present in environments with poor ventilation, it can amass to hazardous levels. It becomes poisonous and can lead to instant death in vulnerable individuals if inhaled during a fire.

When inhaled, the affected individual can become disorientated, suffer from headaches, dizziness, and nausea. It can also lead to convulsions.

Know the Risks

Knowing the risks of fire and smoke can be the difference between life and death. Being informed can help you in times of significant danger.

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