

Many Nursing Homes Need Better Fire, Smoke Protection

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The recently released GAO report titled “NURSING HOME FIRE SAFETY: Recent Fires Highlight Weaknesses in Federal Standards and Oversight,” thoroughly assesses the fire protection situation in the nation’s nursing homes. The report itemizes waivers granted to nursing homes, allowing them to operate with substandard smoke and fire detection and containment measures, but concludes that the installation of sprinklers would alleviate the risk without requiring corrections to the deficiencies identified. This is a dangerous assumption for several reasons.

The report shows that multiple deaths in two nursing home fires resulted from smoke inhalation, rather than fire. It also cites several contributing factors that allowed smoke that killed the patients to migrate basically undetected and unimpeded from the source of the fire to the patient rooms nearby. These factors include a lack of working smoke detectors, lack of automatic smoke dampers in the ductwork, open fire doors, failure of the nursing home staff to respond according to emergency plans, and the ability of smoke to travel in the open and undivided area above the suspended ceiling into patient rooms.

The report faulted the night staff for not responding properly to the existing fire emergency plans, but only touched on how realistic those plans might have been. It suggests that staffing was inadequate, averaging at best one staff person per nine patients. This would allow less than seven minutes of care per patient per hour under normal conditions. If the plan was merely to ensure that fire doors were closed once an alarm went off, perhaps the staff was at fault. However, the emergency plans may have involved moving patients to another area in the facility, which cannot be done quickly - if at all - by one nurse responsible for nine patients, especially when many patients have physical limitations that prevent their rapid removal.

Reliance on nursing staff to assume the role of emergency responders requires closer scrutiny. Often there are too few staff to respond appropriately, and that trend may worsen. In 2000, Peter Buerhaus in the Journal of the American Medical Association (JAMA) reported that by the year 2020, there will be an estimated shortage of nearly 500,000 nurses. That figure is alarming considering our aging population and the U.S. Department of Labor's projected 27.3 percent increase in nursing jobs between 2004 and 2012.

Therefore, patient rooms must be built so that, in an emergency, patients can survive until trained rescue personnel can safely remove them. This argues for more vigorous enforcement of requirements that prevent the movement of fire and smoke between patient rooms, regardless of whether or not sprinklers are installed, and whether or not nursing staff is available.

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A popular trend among design engineers and building owners is to rely on a sprinkler system to prevent the development and movement of smoke, often assuming that the sprinklers nearly always activate satisfactorily. This was the primary conclusion reached in the report.

Yet, the report states that according to NFPA figures, only 82 percent of nursing home fires are contained by properly installed and maintained sprinkler systems. This statistic is consistent with other NFPA statistics showing that sprinklers fail to operate satisfactorily in health care facilities 20 percent of the time for various reasons, including lack of maintenance and water supply. An 18 percent record of failures does not bode well for literally thousands of facilities in which the elderly or infirmed are at risk. If, in fact, there are insufficient resources to ensure that smoke detectors, fire doors and dampers are properly installed and functioning and that smoke barriers are properly constructed and maintained, how are nursing homes likely to obtain the money needed to regularly inspect and maintain a sprinkler system?

Even when sprinklers successfully activate, a smoldering mattress or piece of upholstered furniture may project volumes of lethal smoke and toxic gases without creating sufficient heat to activate the sprinklers immediately. Sprinkler systems are designed to control a fire, not to extinguish it. In fact, once a sprinkler is activated, the resulting drop in temperature and the downward discharge of water from the sprinkler can actually cause the smoke layer to drop to the floor level, reducing visibility, and cutting off possible escape routes.

Properly functioning detection and containment systems are as important as the protection offered by fully functional and properly maintained sprinkler systems. Human error in design, maintenance and repairs, and microbiologically-induced corrosion, are often cited as reasons for unsatisfactory sprinkler performance. Human error also contributes to open fire doors and compromised fire and smoke barriers. That is why it is essential to have multiple protection systems – what is known as balanced fire protection design – in these facilities, rather than rely mainly on automatic sprinkler systems and rescue by nursing staff.

The GAO report states several times that the primary impediment to sprinkler installation has been the cost, but fails to mention what it would cost to bring the existing detection and containment features up to ideal performance levels. Adequate and reliable fire safety can only be achieved in these facilities by spending the time and money to improve detection and compartmentation, in addition to installing and properly maintaining automatic sprinkler systems. Such a balanced approach, combined with a committed maintenance program, will significantly minimize the likelihood of disasterous consequences from a fire.

In most tragic fires, a series of mistakes turns what should be an insignificant event into a disaster. As regards the facility cited in the report, had smoke detection and smoke control features such as smoke dampers been designed into the facility and had the fire doors been properly utilized, the events would probably have had a far different result.

But history has taught us that human error cannot be removed from the risk equation. That is why we need multiple safety systems in automobiles, aircraft, elevators, ocean liners, amusement park rides, and fire and smoke protection systems designed for the built environment. Cutting costs for such protection in nursing care facilities cannot be the primary consideration where lives of elderly or disabled patients are at stake.