Fire in Michigan Hospice Kills Eight Patients

The fire protection systems in this hospice were all present, as was the evacuation planning. The nurses had fire drill training. Yet eight patients died after a small fire burned undetected in a chair. This report tells what happened, and why.

Michael S. Isner

On December 15, 1985, an early-morning fire in a patient room in the west wing of the Hospice of Southeastern Michigan resulted in the deaths of eight patients in that wing. The facility was located on the second floor of a five-story, fire-resistant, L-shaped building owned by the Southfield Rehabilitation Center.

The fire, which was considered suspicious in origin, quickly consumed most of the combustible materials in the room of origin and caused heavy smoke and heat damage in the west wing. In addition, smoke filled the reception area that joined the west and north wings, spread to the north wing, and accumulated in areas on the floors above the fire.

Staff personnel rescued one patient and performed several other emergency activities before the fire forced them to leave the building. When firefighters arrived, they found fire venting from the window of a patient room on the second floor. They extinguished the fire in approximately 15 minutes. Six hospice patients perished during the fire, and two others died from fire-related injuries a few days later. Smoke from the rapidly growing fire was the primary cause of death or injury to the patients.

BACKGROUND

Occupancy Classification of the Hospice

A hospice is a community-based program of professional care designed to relieve the physical, emotional, and spiritual suffering of persons with terminal illnesses. In many instances, the physical and mental condition of hospice patients makes them incapable of self-preservation during a fire. In addition, such patients may not be able to escape for various other reasons, such as sedation from medications or the use of life-support equipment.

Established in 1981, the Hospice of Southeastern Michigan was licensed by the state as a “long term care hospital.”
and had approval for 42 bed spaces. The Joint Commission for the Accreditation of Hospitals (JCAH) also approved this facility for use and classified it as a "hospice." Medicare, which provides the hospice with funding, classifies the facility as a title XVIII Hospice. Medicare requires the building to comply with the 1967 Life Safety Code (NFPA 101) for life safety requirements. The Building Officials and Code Administrators (BOCA) considers the building housing the hospice to be an institutional building of Use Group I-2, which includes hospitals.

According to the 1985 Life Safety Code (LSC) criteria, the facility would be classified as an "existing health care occupancy." The LSC chapter that provides requirements for this type of occupancy lists several categories of facilities, but it does not list a hospice as a category under health care facilities. Of the available categories and descriptions so listed, the hospice most resembles a "hospital."

The Building
The building that houses the Hospice of Southeastern Michigan was owned and operated by the Southfield Rehabilitation Center, which occupied the third and fourth floors with a 108-bed, in- and out-patient treatment facility. The hospice occupied the entire second floor. Other tenant spaces available on the first and fifth floors and in the basement housed various doctors' offices and medically related businesses.

The five-story structure, approved for construction in March 1970, was designed and constructed in accordance with the 1965 Basic Building Code and its 1966 supplement. In addition, the Michigan State Fire Marshal's Office specified that the life safety features in the building comply with the provisions of the 1967 edition of NFPA 101, the Life Safety Code.

The L-shaped building consisted of a 60-by-100-foot north wing, a 60-by-70-foot west wing, and a 60-by-60-foot center core that connected the two wings (see Figure 1). Considered to be Type I (332) construction,¹ the structure contained concrete columns, 8-inch concrete slabs, and cement-block curtain walls.

Interior partitions on the second floor appeared to be representative of those throughout the building. The partitions for both the corridors and rooms, which consisted of painted ½-inch fire-rated gypsumboard on metal studs, were run slab-to-slab. The ceiling in both areas was a flat surface approximately eight feet above the floor slab. It was finished with a rough skim coat of plaster that was applied directly to the concrete slab and then painted. Floors in patient rooms on the second floor were covered with tile. Patient rooms had a 1½-inch solid-core wood door with hardware that provided positive latching when the door was closed. The doors were not self-closing.

Every outside room in the building had an independent air-conditioning unit mounted in the exterior curtain wall. All the air conditioners were also connected to a hot-water piping system fed by a single boiler, an arrangement that allowed the air conditioners to be used as room heaters.

All the patient rooms had private bathrooms in which a transfer grill covered an opening to the ventilation ducts. These ducts passed through the floor slabs and provided ventilation for bath-

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¹ According to NFPA 220, Standard on Types of Building Construction. 1985 edition, a Type I (332) structure will have a 3-hour fire rating for the exterior bearing walls (first digit), 3-hour fire rating for structural frame or columns and girders supporting loads for more than one floor (second digit), and 2-hour fire rating for the floor assembly (third digit).

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Figure 1. Location of patients and equipment on the hospice floor.
A typically furnished patient room at the hospice.

rooms that were vertically aligned. To protect against fire spread between floors, heat-actuated fire dampers were provided in each ventilation shaft at every floor level. The building did not have any other heat, ventilation, or air conditioning (HVAC) ductwork.

**Patient-Room Furnishings**

Each patient room in the hospice contained two hospital beds, two nightstands and a wall-mounted television set. A mattress with a metal frame, metal springs, natural fiber-based matting, and cloth cover was provided for each bed. Also, an ignition-resistant decubitus pad (commonly referred to as "egg crating") was placed above the mattress and under the bed linen, which consisted of sheets, a pillow, and blankets. Curtains were used to cover the window and to provide privacy between bed spaces. In addition, the rooms contained hospital supplies, hospital equipment, and miscellaneous health-related items.

Because of the nature of the facility, the hospice administration attempted to reduce the so-called sterile-hospital environment by allowing various wall decorations, personal possessions, and reclining chairs to be brought into the patient rooms. However, the rooms were not allowed to become cluttered with materials. Records from recent furniture purchases indicated that the reclining chair in the room of fire origin had an outer cover of simulated fabric (100 percent olefin), layers of polyurethane foam padding, and a metal-and-wood frame.

**Fire Protection**

The L-shaped building was divided into three smoke zones by concrete-block walls that were continuous from the foundation to the roof slab (see Figure 1). The only wall penetrations noted on the second floor were the openings for the smoke barrier doors in the corridors, which had a Class B rating and were normally held open by magnetic doorholders. Each smoke zone had an interior stairway enclosed by concrete blocks and equipped with self-closing Class B doors with positive latching.
hardware. Manual pull stations were installed near the three enclosed stairways.

Smoke detectors were installed on each side of the smoke barrier doors, approximately six feet away from the doors. When the detectors activated, they were designed to release the smoke barrier doors. There were no other smoke detectors in the corridors.

A partial sprinkler system provided protection on all floors of the building. Originally, the sprinkler system had protected rooms such as janitor closets, utility rooms, storage areas, and the nurse's lounge. Occasionally, renovation work changed the use of a room and increased the associated hazard; subsequently, the sprinkler system was extended to protect these areas. However, sprinklers were never removed during any modification projects.

An eight-inch feed main provided water to a 1000-gpm electric fire pump, which in turn supplied water to the sprinkler system through a four-inch riser. Waterflow switches were provided at each floor level and were mounted in the two-inch cross main that supplied the floor. Commercial sprinklers with an activation temperature of 165°F were used throughout the building.

The manual pull stations, smoke detectors, and sprinkler waterflow alarms were interlocked with the local alarm system. Activation of any one of these devices initiated an audible alarm on all floors of the building and released all the smoke barrier doors in the building.

Each of the three enclosed stairways contained a standpipe that was connected to the electric fire pump. These standpipes had a single 2½-inch hose connection at each floor landing of the enclosed stairways. The standpipes also provided water to the ½-inch hose stations for occupant use in the corridors near each stairway. Portable fire extinguishers were available in the cabinets holding the ½-inch hose.

Room doors were approximately 43 inches wide and the smoke barrier doors were approximately 38 inches wide. The smoke barrier doors were installed in pairs, with no center mullion. This arrangement left a clear opening about six feet wide through the doors. The maximum distance between a hospice patient room and the smoke barrier doors or the enclosed stairway was about 20 feet in the west wing and about 40 feet in the north wing. The corridors, which were 8 feet wide, and the stairways had provisions for both normal and emergency illumination.

**Staff Training and Emergency Services**

The Hospice Fire and Disaster Emergency Plan was last revised in January 1984. The plan listed recommended actions for any staff member(s) who discovered a fire, and explained the special responsibilities of various departments, such as dietary, housekeeping, and administration.

All staff personnel received fire evacuation training during their initial orientation. In addition, a hospice policy indicated that personnel were required to receive supplemental fire evacuation training, but the frequency of this training was not specified. To complement the training, periodic fire evacuation drills were to be performed. The frequency of drills was reportedly adequate, according to the State Fire Marshal’s...
Office. However, several part-time nurses had not participated in recent fire drills, apparently because they were off-duty when the drills were conducted.

**Occupant Status**

Although the hospice had a state license that authorized the use of 42 bed spaces, the facility had only 28 beds available. On the morning of the fire, 27 patients were in the hospice, 14 in the west wing and 13 in the north wing (see Figure 1). All the patients had some form of terminal cancer.

In addition to the patients, seven nursing staff members, four relatives, and a chaplain were in the hospice that morning. Three nurses were assigned to each wing, and the seventh nurse was the supervisor for both wings. The daughter of a patient and two children of nurses were sleeping in the day room. Another child of an employee was sleeping in a north-wing room. The chaplain was present to perform Sunday morning services and to assist the staff.

**THE FIRE**

**Occupant Response**

At approximately 6:00 am on Sunday, December 15, 1985, the nursing staff was performing routine patient care and other duties. Two nurses were in the west wing; one nurse was preparing medicines by the nurses' station in the center core; and two other nurses were dispensing medicines in the west wing. The remaining nurse and the head nurse were performing miscellaneous activities throughout the second floor.

Meanwhile, the chaplain and several nurses passed by Room 207, the room of fire origin, and some nurses even entered it; however, no one reported noting any abnormal conditions.

Between 6:30 and 6:36, the two nurses in the north wing decided to go to the chapel at the end of the west wing. When the nurses were near the reception area and able to see down the west wing, they noticed a slight haze near the ceiling of the wing’s corridor. They hurriedly went to Room 207 and discovered the fire. Yelling “Fire!” the nurses immediately began their emergency procedures.

One nurse entered the room, even though smoke was beginning to accumulate. Despite the smoke, she went to the bed near the window and closest to the fire. Flames were coming from the left front corner of the reclining chair, and the nurse noted that the fire was beginning to spread from the chair to the bed, where a patient lay with his socks beginning to burn. She extinguished fire in the patient’s burning socks with a towel, took the patient out of the room, moved him to the reception area, and returned to Room 207. Rapidly deteriorating conditions forced her from the room and prevented her from rescuing the second patient. Without closing the door to Room 207, the nurse left the west wing to assist with rescue activities in the north wing. She eventually left the building through the north wing’s enclosed stairway.

During this time, the other nurse ran toward the main desk in the central core to alert people there. She then ran back to the chapel to alert people in that part of the wing. On her way, she reportedly attempted to close patient-room doors. After leaving the chapel, she began to have difficulty breathing, so she left the building.

The head nurse was near the reception area. As soon as she was notified of the fire, she called the fire department; the time was 6:39. Another nurse who was
near the reception area went to the north wing to close doors; the head nurse soon followed. These two nurses apparently left the building through the north stairway. The second nurse from the reception area reportedly attempted to close doors in the west wing, then went to the day room to make sure the three relatives escaped. She and the children from the day room left the building through the south stairway. The employee’s child asleep in a north-wing room was also taken out of the building.

The chaplain became aware of the fire, left the chapel, and moved toward Room 207, where he noticed a nurse attempting to remove the remaining patient. Because conditions in Room 207 and in the corridor were beginning to deteriorate rapidly, the chaplain warned the nurse to leave the room, and she did. The door to the room of fire origin remained open. The chaplain continued down the west-wing corridor to assist the patient rescued from Room 207, who had been brought to the reception area and placed in a wheelchair. He then helped nurses move the rescued patient through the north wing and out the enclosed north stairway.

The two nurses dispensing medicine in the west wing were in Room 205 when they became aware of the fire. One of them went to the reception area and used a manual pull station by the stairway to initiate a fire alarm. The local alarms began to operate while the head nurse was on the telephone reporting the fire to the fire department. All the magnetically operated smoke barrier doors in the building were released upon activation of the fire alarm system, except for one smoke barrier door to the west wing, which was held partially open by the door’s coordinator. After initiating the building alarm, the nurse went back to Room 207, but the extreme heat and smoke also prevented her from rescuing the remaining patient and closing the patient-room door. She went to the north wing and eventually left the building through the north stairway. The second nurse from Room 205 left the building after learning of the fire.

As soon as the nurses in the Rehabilitation Center located on the third and fourth floors learned of the fire in the hospice from the sounding alarm, they evacuated all their patients from the west wing and moved them horizontally to the north wing. These floors were never completely evacuated.

**Fire Department Response**

The Southfield Fire Department received the head nurse’s telephone call reporting the fire at 6:39 and immediately dispatched two engines, one “life unit,” one squad, one ladder company, and one tower company. The first apparatus notified the dispatcher that they were en route to the scene at 6:41:16.

The first officer, responding in his own vehicle, reached the scene a few moments before the first fire apparatus and was met by a nurse, who told him the location of the fire. He saw flames coming out of a second-story window in the west wing. Entering the building through the south stairway, he encountered light to moderate smoke in the second-floor reception area. From his position, the officer could see that smoke was spread-
ing to this area because one of the smoke barrier doors to the west wing was not fully closed.

Deciding to make an internal initial attack on the fire, the officer contacted the first-due engine company and ordered them to the south side of the building. When they arrived at 6:43:51, the officer requested that a 1 1/2-inch handline be brought to him in Room 211, which was on the non-fire-involved side of the smoke barrier doors. The arriving crew separated. Some firefighters laddered the building, bringing the handline to the officer through a window. The attack crew entered the building and went up the reception-area stairway. By the time they reached the reception area, enough smoke had accumulated to require them to don self-contained breathing apparatus (SCBA). Taking the handline from the officer in Room 211, who was without SCBA, the crew advanced the line into the west wing. Although they found the corridor full of heavy smoke and experienced severe heat, they extinguished the fire in about 15 minutes.

While they were attacking the fire, other firefighters arrived. Some immediately assisted firefighters in the west wing, some entered the north wing, others began to set up equipment outside the building, and some established a triage area.

All the firefighters who entered the west wing early in the fire noted extreme heat and heavy smoke that required the use of SCBA. They also noted that conditions at the nurses' station were worsening as time passed. They found the door to Room 207 open and the doors to other west-wing rooms in various positions, but noted that the room doors in the north wing were all closed.

Casualties and Damage

After extinguishing the blaze, firefighters discovered six fatalities in the west wing (see Figure 3). All of the victims were found in their beds. The victims removed on the day of the fire had carbon monoxide blood levels ranging from 52.8 to 82.2 percent.

The remaining 21 hospice patients were evacuated and taken to various hospitals. Two of them died a few days later, increasing the fire-related death toll to eight. In addition, 13 civilians, eight police officers, and one firefighter were injured.

The most severe damage occurred in the west wing of the second floor. The fire in Room 207 consumed about half the room's contents and damaged the corridor near the door. Flames shooting from the room's window scorched the exterior of the building. Extensive heat damage occurred on the wall directly across the corridor from the room of fire origin. Lesser heat damage, such as melted light lenses, was evident along the full length of the west-wing corridor. The corridor and several rooms were severely damaged by smoke. Most patient rooms had smoke stains on the doors, door frames, and walls immediately inside the doors. Because the doors to Rooms 203 and 209 were closed during the fire, these rooms were virtually free of smoke stains.

Smoke spread up to the fifth floor by way of the three stairways and the ventilation ductwork for the bathrooms. Lesser amounts of smoke accumulated on the third and fourth floors. The smoke spread to these floors primarily through the stairways. All second-floor rooms and corridors that were not damaged required cleaning after the fire. In addition, most areas above the fire and some on the first floor also required some cleaning.

ANALYSIS

Ignition and Fire Growth

Southfield fire investigators listed the fire cause as “suspicious.” Several nurses who had been near or in the room of fire origin before the discovery of the fire did not report any evidence of smoldering in the reclining chair in that room. The first indication of a problem was the observation of haze in the west-wing corridor; seconds later, nurses found a flaming fire in the reclining chair in Room 207. Since only a short time had elapsed from the appearance of the staff in Room 207 to the time the fire was discovered, an open-flame ignition scenario seems likely.

When the fire was discovered, it was producing sufficient radiant heat to spread to the bed, which was about 19 inches away. There is little doubt that by this time, significant amounts of combustion products were accumulating at the ceiling of Room 207. As the smoke layer increased in temperature and thickness, radiant heat produced by the layer would have begun to preheat other materials in the room. The accumulation of combustion products and the generation of excessive heat were so rapid that the nurse who initially entered Room 207 was able to rescue only one of the two patients. When the second nurse went to Room 207, severe conditions in the room also prevented her from rescuing the second patient. Since this nurse went to Room 207 immediately after activating the local alarms at 6:39, it appears that the severe conditions in the room of fire origin occurred over a minute before the first fire apparatus notified the dispatcher at 6:41:16 that they were en route. (See Time Line).

When the first fire officer reached the scene, he found that most of the nurses had already left the second floor. The fire had broken out the window in Room 207 and was venting. Arriving at the second floor, the officer found smoke quickly filling the reception area and conditions in the west wing so severe that entry without SCBA was impossible. These conditions plus statements from the nurses indicate that Room 207 was fully involved in fire before the officer arrived on the scene. Since he arrived at approximately 6:43, it appears that fire fully involved Room 207 in less than five minutes (estimated ignition time 6:38; see Time Line).

The rapid fire growth is attributed to the ignition scenario, the combustibility of the reclining chair, and the position of the chair in relation to the wall and other combustible materials in the room.

Staff Performance

Once they were aware of the fire, most of the nurses attempted to carry out procedures that are commonly recommended in firesafety plans. For example, one nurse rescued a patient in the room of fire
origin and went to the north wing to close doors. Another nurse alerted others and attempted to close doors in the west wing. The head nurse called the fire department and closed doors in the north wing. A third staff nurse activated a manual pull station and attempted to rescue the second patient in Room 207. The chaplain aided the patient who had been rescued from the room of fire origin. These activities indicate that many of the staff knew some of the appropriate actions for a fire emergency.

Even though several recommended procedures were attempted, the rapid fire growth and deterioration of environmental conditions prevented the completion of many activities. Increasing heat forced nurses out of Room 207 before the second patient could be rescued. In the west wing, where the most severe conditions occurred, most of the patient-room doors were partially closed. This suggests that the nurses did attempt to close doors, but they did not take the time to ensure that the doors were fully closed and latched. Comments from several nurses indicate that they did not expect the rapid environmental changes experienced during this fire.

Performance of Building Components and Fire Protection Systems
All the patients who died in this fire were occupants of rooms where doors had been left fully or partially open (see Figure 3). The doors to individual patient rooms notably affected smoke spread in the west wing. Very little smoke seeped into Rooms 203 and 209 because the doors to these rooms were closed. Even though Room 209 was adjacent to the room of fire origin, the two occupants in that room survived. There were no patients in Room 208. The smoke patterns on door frames, door ends, and interior room walls indicate that the doors to Rooms 207 and 208 were fully open during the fire. The doors to the remaining rooms (201, 202, 204, 205, 206, and 210) were apparently partially open.

In the room of fire origin, exposed concrete columns and plaster finish on the ceiling were discolored from flames, heat, and smoke, but these building components showed no other evidence of damage. The ½-inch gypsum wallboard forming the room walls remained intact, even though the reclining chair was next to the wall and was totally consumed by fire. The protection against fire spread provided by the floor/ceiling assemblies and walls was compromised when the door was left opened, allowing combustible products to enter the corridor.

Smoke in the corridor was detected by staff personnel, who immediately began to alert other people. Similarly, it was staff members who activated the local alarm system and released the smoke doors. A post-fire inspection of the detectors located by the west-wing smoke doors revealed that they had been operational. Two problems, one with a connector for the detector and the other with the system wiring, appear to have prevented the detector signal from activating the alarm system and releasing the door holders.

Unlike the partially closed patient-room doors, the smoke barrier door that was held partially open did not contribute (Continued on page 78)
to the number of fatalities during this fire. However, complete closing of the smoke door might have reduced the number of injuries outside the west wing by reducing the amount of smoke that spread into other areas.

In addition to smoke spread attributed to the partially open smoke door, smoke was able to travel to other parts of the building by way of the ventilation system and the three enclosed interior stairways. Though equipped with heat-actuated dampers, the ventilation system for the bathrooms remained open during the entire incident, which enabled smoke from the second floor to enter the bathrooms on floors above the fire. The opening of stairway doors during the fire allowed the south and west stairways to become filled with smoke. Smoke from the west stairway leaked through cracks between the door and the floor in sufficient quantities to leave smoke stains on the fifth-floor rug.

No provision for automatic notification of emergency forces was included in the alarm system design. The exclusion of this alarm function was allowed according to the 1967 edition of the Life Safety Code requirements. However, it is likely that automatic notification of emergency forces would not have had a drastic effect on the results of this fire. The nursing supervisor promptly called the fire department after becoming aware of the fire. During this call, the manual pull station was operated, initiating the local alarm. This action would have sent the alarm to the fire department if a provision for automatic notification had been included in the alarm system design. Since the supervisor was already in contact with fire department personnel, they would not have learned of the fire any earlier if automatic notification had been provided.

If the detection system had operated properly and automatic notification had occurred, the fire department response might not have been greatly changed. The supervisor called the fire department within moments after the smokey haze was noted at ceiling level outside Room 207. Since a smoke detector was about 10 feet from the door to this room, the detection system probably would have operated at about the time that the supervisor began her call. As a result, the fire department response might have begun only slightly earlier, and the severe conditions would probably still have occurred in Room 207 and in the west-wing corridor before firefighters arrived.

Although fire extinguishers and hose stations equipped with 1½-inch fire hose were provided in the building, neither the staff nor firefighters used them. Similarly, standpipes were provided in the stairways, but firefighters chose not to use the equipment.

**DISCUSSION**

Health care facilities provide sleeping accommodations for many people who are incapable of self-preservation because of age, physical disability, or mental disability. Still, a reasonable level of safety for occupants may be provided by limiting fire development, restricting it to the room of origin, and minimizing the need for occupant evacuation except from the room of fire origin. 2 To accomplish this, the NFPA Committee on Safety to Life indicates that:

> “... protection from fire shall be provided by appropriate arrangement of facilities, adequate staffing, and careful development of operating and maintenance procedures composed of the following:

(a) Proper design, construction, and compartmentation; and
(b) Provisions for detection, alarm, and extinguishment; and

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<td>06:00-06:15</td>
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<td>06:39:53</td>
<td>*Dispatch Center starts tone.</td>
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<tr>
<td>06:40:10</td>
<td>*Dispatcher starts to announce fire location and other details.</td>
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<tr>
<td>06:40:35</td>
<td>*Dispatcher completes announcement.</td>
</tr>
<tr>
<td>06:41:16</td>
<td>*Engine 1 on air and responding to hospice.</td>
</tr>
<tr>
<td>06:42:15</td>
<td>*First-line officer on scene and smells smoke (southeast corner of</td>
</tr>
<tr>
<td></td>
<td>building).</td>
</tr>
<tr>
<td>06:43:29</td>
<td>Nurse draws his attention, and he proceeds around outside of building;</td>
</tr>
<tr>
<td></td>
<td>observes that fire has broken a window and is venting.</td>
</tr>
<tr>
<td>06:43:31</td>
<td>*Second telephone call reporting fire; dispatcher says fire department en route.</td>
</tr>
<tr>
<td>06:45:10</td>
<td>*Engine 1 on scene, ordered to set up by south side of building.</td>
</tr>
<tr>
<td>06:45:31</td>
<td>*Squad to assist in rescue and evacuation.</td>
</tr>
<tr>
<td>06:46:15</td>
<td>*Third alarm called.</td>
</tr>
<tr>
<td>06:47</td>
<td>Initial fire attack started. &quot;Zero visibility&quot; in room and corridor beyond south doors.</td>
</tr>
<tr>
<td>06:47:20</td>
<td>*Engine 1 confirms fire in patient room.</td>
</tr>
<tr>
<td>06:48:05</td>
<td>*Heavy smoke reported on second floor.</td>
</tr>
<tr>
<td>06:49:10</td>
<td>*Call for more firefighting personnel.</td>
</tr>
<tr>
<td>06:49:20</td>
<td>*Medical command post established in northeast parking lot.</td>
</tr>
<tr>
<td>06:49:45</td>
<td>*Evacuation of second floor ordered.</td>
</tr>
<tr>
<td>06:50:00</td>
<td>*Medical Disaster Plan activated; injured to be brought to northeast parking lot.</td>
</tr>
<tr>
<td>06:57:30</td>
<td>*Firefighters still not sure how many occupants are on the second floor.</td>
</tr>
<tr>
<td>07:00:15</td>
<td>*Fire out. First body found.</td>
</tr>
<tr>
<td>07:03:53</td>
<td>*Two more bodies found.</td>
</tr>
<tr>
<td>07:06:43</td>
<td>*Total number of fatalities is reported to be four; it could reach five.</td>
</tr>
<tr>
<td>07:10:17</td>
<td>*Smoke is still heavy on floor.</td>
</tr>
<tr>
<td>07:54</td>
<td>*Six fatalities are confirmed on the scene.</td>
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*Time was obtained from Southfield Fire Department tape that records all activities in the Dispatch Center.*

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(c) Fire prevention and the planning, training, and drilling in programs for the isolation of fire, transfer of occupants to areas of refuge, or evacuation of the building. 7

This approach is called the "total concept" toward life safety in a health care facility. 4 It emphasizes that designs for firesafety in health care facilities must not depend wholly upon any single safeguard. 4

The firesafety program at the Hospice of Southeastern Michigan appears to have included most of the firesafety provisions presented in the outline of the "total concept." For example, the building was a fire-resistant structure with noncombustible interior partitions. Doors were provided for all rooms. Smoke detectors, smoke doors, and protection for hazardous areas were provided. The building was periodically inspected, a fire emergency plan had been developed, staff personnel received fire evacuation training, and evacuation drills had been held.

The typical fuel load in a patient room has generally been understood to be low. 5 Recently, however, it has become recognized that certain arrangements and types of fuels in patient rooms can produce large fires in short periods of time, thus creating especially hazardous situations. In fact, any combination of finishes, combustible building materials, or contents and furnishings that could result in full room involvement or flashover in five minutes or less presents a severe fire hazard in a health care facility. 6

This finding was confirmed by fires at the Wincrest Nursing Home and the Cermak House. 7, 8 Each facility contained acceptable state-of-the-art fire protection features. However, the patient-room fire load in both nursing homes was increased through the use of combustible clothing wardrobes. The Wincrest Nursing Home fire resulted in 24 civilian deaths and the Cermak House fire caused 8 civilian deaths.

When a reclining chair and other decorations were added to the patients' rooms at the Hospice of Southeastern Michigan, the fuel load for those rooms was increased. A corresponding increase occurred in the potential for rapid fire growth and full room involvement. But the fire protection systems, evacuation planning, and staff training at the hospice were more appropriate for the typical health care facility with a low fire load.

The flaming ignition allowed the fire to quickly involve and develop in the reclining chair. Without early detection or suppression, the fire was able to continue its rapid growth and spread before it was discovered. The nature and quantity of the materials ignited early in the fire released a large volume of smoke and high heat in a short time period. This reduced the amount of time in which the staff had to act. Staff personnel, apparently because of their haste, did not fully close doors to many patient rooms, allowing the combustion products to reach the patients in the wing of fire origin. Accordingly, the following are considered to be major factors contributing to the loss of life in this fire:

- Lack of detection and extinguishment early in the fire.
- Rapid development of untenable conditions within and beyond the room of fire origin, and
- Patient-room doors left fully or partially open during the fire.

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6 Ibid.
