



# HOSPITAL PROPERTY

Risk Management and Insurance in a Changing World

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# Risk Management and Insurance in a Changing World

### **Executive summary**

A fire or a natural catastrophe can be damaging to any organization, but it can be especially disastrous for a hospital. Patient safety issues are of paramount concern, but risk managers and administrators also must assure that the hospital will remain functional and continue

to fulfill its mission to the community. Even a water leak that might be little more than an annoyance at another type of facility can render mission-critical diagnostic and treatment equipment unusable.

A hospital is comprised of a wide range of services and functional units, resulting in complex engineering and risk management challenges. To make matters yet more complicated, the healthcare sector is undergoing rapid transformation, driven by factors such as changing demographics, new technologies, and legislated reforms which have implications for property loss control and risk

management. Many hospitals also are under pressure to reduce costs, leading to difficult budgeting decisions that may mean fewer funds for property loss prevention measures.



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### Introduction

Health services need to be accessible and functioning at maximum capacity at all times. But events such as a fire, a flood, an earthquake or a hurricane can bring a hospital to its knees at the time it is most needed.

Addressing the property risk factors of hospitals always has been challenging, but never more so than today. The healthcare sector is in the midst of far-reaching transformation. Factors influencing the pace and breadth of this transformation include changing demographics, advancements in technology, heightened patient expectations, and legislated reforms, all of which have implications for loss control and risk management.



Although budgets are tight, decision-makers must keep in mind that a flood, a fire, or a natural catastrophe can cripple a hospital, and may even take it entirely out of commission.

Care delivery models are evolving and, as they do, the physical characteristics of hospitals are changing. The ever-expanding volume of electronic records has sparked a surge in IT-related renovations, with the need for specialized protection, detection and suppression systems. Increasingly expensive and highly sensitive electronic medical equipment make even a burst pipe a mission-threatening event. In addition to healthcare-specific changes, broader societal trends, such as a growing emphasis on sustainable building, are reverberating through the healthcare sector, bringing with them an array of property loss control issues.

The challenges posed by rapid change in the healthcare sector are augmented by the fact that many hospitals are faced with the need to cut costs. Budgets are under pressure, and projects such as retrofitting buildings to better withstand natural disasters are being deferred. In many cases, these costs are so great that organizations need to construct entirely new buildings. Financial pressures also fuel merger and acquisition activity, increasing the load on risk managers and loss control specialists involved in the due diligence process and who potentially assume headaches from financially strapped acquisition targets that may have let maintenance lapse.

Although budgets are tight, decision-makers must keep in mind that a flood, a fire, or a natural catastrophe can cripple a hospital, and may even take it entirely out of commission. Risk managers and loss control specialists need to be champions for promoting mitigation strategies and advocating for an adequate portion of sparse budgets to be allocated to assure that patients are as safe as possible and that the hospital will be able to continue to operate under even extreme circumstances.

A well-designed insurance program also is essential to assure that hospitals are protected to the fullest extent possible. Insurers have responded to the unique needs of hospitals with policies tailored to healthcare organizations that provide broad coverage for a wide range of exposures. The complexity of hospital property exposures make it essential that risk managers work with brokers and insurers with deep expertise in this area.

### **Perils**

In classical thinking, earth, wind, fire and water are the four fundamental elements believed to comprise the essential parts and principles of which all things consist. They also are representative of the principal perils to which healthcare facilities and other structures are exposed: earth movement damage, wind damage, fire damage and water damage.



Water damage is the leading cause of property losses in hospitals and other healthcare facilities, according to Zurich claims data.

Since patients often cannot be quickly and safely evacuated, and since hospitals must be functional despite extraordinary circumstances, it is imperative that hospital buildings be constructed to withstand the full spectrum of extreme events. To understand design and protection features and risk management strategies, and how transformations in healthcare are affecting them, it is useful to first consider the common perils which hospitals are exposed to.

### Water

Water damage is the leading cause of property losses in hospitals and other healthcare facilities, according to Zurich claims data. More than 40 percent of hospital claims by count and more than 60 percent of claim dollars are due to liquid. On average, such claims are three times more expensive than claims that do not involve water. Broken air conditioners, burst water pipes, and ruptured sprinkler systems are some of the common causes of water damage in hospitals.

The high cost of these claims is mostly attributable to the expenses associated with cleaning sensitive electronic equipment such as MRIs, accelerators, simulators and cardiac monitors. In addition to the direct costs of cleaning and testing the equipment, business interruption costs can mount as patient services are delayed or scheduled with other providers.

Of course, hospitals are also subject to more dramatic types of water events. Floods are America's most common and most expensive natural disasters, according to FEMA. A flood resulting from a tropical storm or a hurricane can be especially damaging. Tropical Storm Allison, for example, filled Memorial Hermann hospital in Houston, Texas with nearly 40 feet of water in June 2001. Flooding as a result of Hurricane Irene shut down the state mental hospital in Waterbury, Vermont, which continues to put stress on the state's mental health system.<sup>1</sup>

Earthquakes also can result in extensive water damage when sprinkler systems are ruptured. Sprinkler-related water damage was a major component of the total losses paid by commercial insurance companies following the Northridge Earthquake in 1994. Many insurers reported that they paid out more in claims due to sprinkler leakage than to earthquake shake damage.<sup>2</sup>

#### Fire.

In December 2011, a fire in an upscale hospital in Kolkata, India, the Advanced Medical Research Institute (AMRI), killed 94 people. What initially seemed to be a minor blaze in its basement became an inferno that essentially transformed the hermetically sealed building into a giant



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chimney. The hospital's fire detection and suppression systems failed, and firefighters were slow to arrive.

The AMRI fire is a sobering reminder of how potentially cataclysmic a major hospital fire can be. However, it is unlikely the same scenario would be repeated in an American hospital. According to the National Fire Protection Association, more than 8,000 hospital fires occur each year.<sup>3</sup> Almost all are quickly identified and extinguished. Building codes and standards for American hospitals make it far more likely that hospital corridor walls have been properly constructed, appropriate smoke and fire barriers have been installed, areas most likely to sustain a well-developed fire are protected or enclosed, and fire detection and suppression systems have been installed. Fires usually can be contained, often requiring the evacuation of only those people in the immediate fire area.

State and local building codes are based on the model International Building Code (IBC). Hospitals treating patients reimbursed under Medicare must also meet federal standards. To be accredited, they must meet standards of The Joint Commission (TJC), previously the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO). Generally, the federal government and TJC refer to the National Fire Protection Association (NFPA) model fire codes, including Standards for Health Care Facilities (NFPA 99) and the Life Safety Code (NFPA 101).<sup>4</sup>

Even the best-designed hospital has numerous fire-related loss control challenges. The risk of fire is dependent upon facility design, occupancy, the fire protection system, and the functions conducted in the facility. Some of the materials used in hospitals are highly flammable or combustible. These include alcohol and cleaning fluids. Additionally, oxygen and nitrous oxide, which may be omnipresent throughout a hospital in piped gas systems, are oxidizing gases that promote combustion in materials. The use of specialized equipment such as lasers and other ignition sources in oxygen-enriched atmospheres increases the threat of fire.

Information technology is increasingly vital to the operations of many hospitals, and computer rooms present a number of challenges in protecting equipment that is easily damaged by heat, smoke and soot. Expensive and sensitive electronic medical devices, especially MRIs, also can present vexing challenges in protecting them from damage by fire.

### Wind

Wind damage from a tornado or hurricane is a common cause of hospitals being forced to close down. Wind not only can cause extensive structural damage, once the interior envelope is breached, it can cause debilitating non-structural damage.



It often is not wind damage alone that cripples a facility: in many cases it is consequential effects that cause the most damage. It often is not wind damage alone that cripples a facility: in many cases it is consequential effects that cause the most damage. Wind often will blow off a roof or blow in windows, permitting water in. The list of the damage to Mercy St. Johns Hospital in Joplin, Missouri resulting from a tornado is practically an encyclopedia of the type of damage that can follow from severe wind damage: the fire sprinkler system discharged leaving 3 to 6 inches of standing water; gas lines were broken and there was a strong smell of natural gas throughout the building; sewer lines were destroyed and raw sewage was projected throughout the facility; the oxygen tank was destroyed, discharging all the liquid oxygen; and ceilings collapsed, sending equipment crashing down on floors below. The facility was filled with hazardous waste and radioactive material was unsecured.<sup>5</sup>

### Earth movement

Earthquakes also have damaged hospitals to the point they no longer can fulfill their missions. The 1994 Northridge earthquake, for example, caused an estimated \$3 billion in damage to Southern California hospitals and resulted in 12 being declared as unsafe for occupancy. <sup>6</sup>

Even if structural damage is minimized by earthquake-hardened construction, hospitals are exposed to extensive non-structural damage, largely from unsecured equipment being tossed about. Additionally, as noted previously, a ruptured sprinkler system can damage expensive electronic equipment.

### Managing property risks in a rapidly-changing environment

Driven by legislative actions, changing demographics, macroeconomic forces, new technologies, and heighted patient expectations, the healthcare sector in America is being transformed at a stunning pace. While the property perils facing hospitals remain unchanged, many of the transformations have implications for property risk management and loss control. Some changes, such as advancements in medical technology, have created new exposures and loss control requirements, while others, such as the need to slash costs, create obstacles for risk managers and loss control specialists to achieve their objectives.



Additionally, risk management budgets are under pressure, meaning that risk managers must do more with less.

### Cost reduction

Hospitals must cut operating costs by 10 to 20 percent in the next three to five years in order to survive, according to the Candem Group, a consulting company specializing in healthcare. Capital budgeting always is a matter of compromises and tradeoffs, but it becomes an especially delicate balancing act in times when many hospitals are faced with the need to cut costs. Improving resistance to water, fire, wind and earthquake can be expensive, making it less likely that these measures will find their way into distressed budgets. Additionally, risk management budgets are under pressure, meaning that risk managers must do more with less.

Just how difficult it can be to find the money to make needed improvements is playing out statewide in California. Following the Northridge Earthquake in 1994, the California Legislature strengthened seismic requirements for hospitals. As of 2009, about half of California hospital buildings had not made fixes that should have been finished at the start of 2002, according to a December 2009 report from state regulators.<sup>8</sup> A new analysis by the RAND Corporation shows that almost half of California hospitals will not meet seismic safety standards by a 2013 state deadline, and many may have trouble becoming earthquake safe by the final 2030 deadline.<sup>9</sup> The estimated cost of compliance is \$110 billion.<sup>10</sup>

Tight budgets and cost-cutting measures may mean that much-needed upgrades, renovations and repairs for fire protection also are being deferred, though it may mean that the facility is out of compliance with codes and regulations. The Rainbow Mental Health Facility, a psychiatric hospital in Kansas City, KS, for example, was shut down by the State Fire Marshall's Office in October 2011 after an inspection found 11 pages of violations that required repairs and upgrades for which no money had been allocated in an already-stressed budget. The cost for renovations was subsequently reallocated in the budget, and the hospital is scheduled to reopen summer 2012.

In addition to local fire codes, hospitals also are compelled to meet TJC criteria for accreditation. Hospitals are often facing difficulties in meeting these standards in the current environment. TJC, in October 2011, published Elements of Care (EC) and Life Safety (LS) requirements for which "accredited and certified organizations were most frequently identified as not compliant for the first six months of 2011." They are:

- Building and fire protection features are designed and maintained to minimize the effects of fire, smoke, and heat.
- The hospital/critical access hospital maintains fire safety equipment and fire safety building features,



Assessing the risks posed by an acquisition target – including property risks – should be an essential part of the due diligence process.

- The hospital/critical access hospital maintains the integrity of the means of egress.
- The hospital/critical access hospital provides and maintains systems for extinguishing fires.
- The hospital/critical access hospital provides and maintains building features to protect individuals from the hazards of fire and smoke.

For all requirements, 50 percent or more of hospitals and critical access hospitals were found to be noncompliant. <sup>13</sup>

Some cost-cutting measures also may increase the likelihood of a fire or other property loss. Reducing the frequency of emptying waste containers and increasing their size, for example, increase fire risks, according to a German study of hospital fires. <sup>14</sup>

### Consolidation

"Nearly every independent hospital board is examining the questions, 'Can we remain independent?' and 'Should we remain independent?'" according to the Candem Group. 15 The need to cut costs and greater difficulty in accessing capital for independent hospitals will fuel mergers and acquisitions. An uptick in M&A activity will create new opportunities and new challenges for risk managers and loss control specialists.

Assessing the risks posed by an acquisition target – including property risks – should be an essential part of the due diligence process. From a property perspective, this means a thorough evaluation of the construction and protection features of a target facility. Issues to be addressed in an audit of a target facility include:

- · Compliance with building codes and standards;
- The potential for the initiation, growth and spread of fires;
- The fire detection and suppression infrastructure;
- The structural integrity of all buildings;
- The potential for losses resulting from natural catastrophes; and
- Preventive maintenance programs and operating procedures.



Although the pace of economic recovery and the impact of health-care reform legislation and other drivers of change on capital budgets are significant unknowns, it is likely that there will be an uptick in healthcare-related construction in the coming years.

The process also should include an assessment of the target's risk management and loss control practices and procedures.

### Increased construction activity

Although the pace of economic recovery and the impact of healthcare reform legislation and other drivers of change on capital budgets are significant unknowns, it is likely that there will be an uptick in healthcare-related construction in the coming years. Healthcare construction lagged in recent years due in part to the economic downturn, but it is now on the rise again. In the opinion of some experts, it will continue at an elevated pace for years to come. Driving the need for new and renovated healthcare facilities is the aging population, outdated facilities, healthcare reform that is expected to extend coverage to an additional 36 million Americans and quickly advancing technologies. Reed Construction Data predicts an 8 percent increase in healthcare construction spending in 2012 with another 13 percent increase in 2013.<sup>16</sup>

Renovations and new construction offer the opportunity to introduce construction and protection features that will enhance a facility's ability to withstand damage from water, fire, wind and earth movement. The challenge for risk managers and loss control specialists will be to make the case for allocating a non-trivial portion of capital budgets to these construction and protection features.

### Information technology and electronic medical records

Hospitals must manage more data than ever, and there is no indication the trend is likely to change anytime soon. Additionally, many hospitals are moving ahead with the implementation of electronic medical records (EMRs), due largely to incentive funding for EMR implementation as part of the American Recovery and Reinvestment Act. As a result, many hospitals are increasing their IT capacity. A 2011 survey by the American Hospital Associations' Health Facilities Management magazine and American Society for Healthcare Engineering found that more than one in four respondents were upgrading building services systems to satisfy IT infrastructure needs, and one in five was planning to upgrade, or was in the process of upgrading, a data center. <sup>17</sup>

Computers are highly sensitive to heat, smoke and soot. Protecting this vital equipment should be a high priority of every hospital. However, extinguishing agents such as water, dry chemicals and foams, can cause more damage than the fire itself. "Clean agents" – fluorocarbon-based agents and inert gas agents – are non-conductors of electricity and if permitted by local fire codes can be employed for the protection of electronic equipment.



The technologies themselves also may create loss exposures. Lasers, for example, can become ignitions sources, especially in oxygenrich environments.

### New medical technologies

New highly sophisticated diagnostic and treatment technologies can pose a number of risk management and loss control challenges. Since the machinery is often very expensive, and frequently is essential to the successful functioning of the hospital, it requires special attention to its protection. This can include the use of high sensitivity smoke detection systems and clean agent suppression systems.

The technologies themselves also may create loss exposures. Lasers, for example, can become ignitions sources, especially in oxygen-rich environments. A laser can heat a fuel up to several yards away.<sup>18</sup>

Imaging technologies present particularly difficult property loss control challenges. MRIs are cooled by liquid helium which, if it comes into contact with oxygen in the air, can cause an explosion or fire. Problems with an MRI in Alabama, for example, caused an explosion that destroyed the MRI unit and caused structural damage to the hospital facility. <sup>19</sup> The magnetic fields produced by imaging equipment can rip a metal fire extinguisher from a person's hands and can cause firefighter tools to become dangerous projectiles. Additionally, some of the newer, more powerful machines can negatively impact the metal components of a fire suppression system. <sup>20</sup> Only non-ferromagnetic extinguishers should be used near MRI scanners. Fire suppression system piping and heads also should be made of nonferrous materials.

### Green building design

Over the past decade, "green building" design principles have become a part of building design and construction, including the design and construction of healthcare facilities. However laudable these principles are as concerns reducing a building's environmental footprint, they can present property loss control challenges, especially as concerns fire resistance and protection.

The National Association of State Fire Marshals notes a "fire safety gap that currently exists in the interface between established fire safety practices and the new building technologies." The concepts and design elements used to meet a building's sustainable design goals are often in conflict with code requirements. For example, the use of glazing for light transfer can conflict with fire-rated construction. Solar panels present fire safety challenges since they can impede firefighting measures. <sup>22</sup>



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### Improving hospital property loss prevention and risk management

Risk managers and loss control specialists may not be in a position to influence most of the powerful forces reshaping healthcare in the US, but they can take actions to counteract negative outcomes. Their ability to do so, however, is complicated by the fact that hospitals and other healthcare organizations are operating in an environment where cost-cutting is the norm.

Large-scale projects such as retrofitting a hospital to make it more resistant to natural disasters are more likely to be deferred in the current environment, but smaller-scale initiatives can have far-reaching results. Water is the leading cause of damage in a hospital, but it also is a peril that can be effectively addressed with minimal cost to the organization. Piping in older hospitals is more likely to fail, so greater maintenance and testing is needed to assure the integrity of pipe, fittings and equipment. Proper water treatment, as well as system maintenance and testing, should be practiced in such areas of the country that have public or private water supplies containing certain minerals that increase the corrosion rate of water. Fire sprinkler systems should be inspected regularly, especially to identify damaged heads. Hospitals in earthquake-prone areas should use piping and sprinkler systems designed to be earthquake resistant.

The number and severity of fires also can be reduced by inexpensive, blocking-and-tackling measures such as inspecting and maintaining electrical equipment and assuring that fire extinguishers and fire suppression systems are in good working order. Replacing conventional ABC fire extinguishers with clean agent extinguishers in rooms with electronic medical devices can help preserve expensive and mission-critical equipment in the event of a fire. Training employees to effectively respond to a fire is essential. Staff should be drilled to follow the "R.A.C.E." acronym if there is a fire or suspected fire: Rescue – Alarm – Confine/Contain – Extinguish.

Healthcare construction is expected to increase, creating opportunities to upgrade existing systems in renovations and implement superior systems in new construction. Much of the current construction activity involves renovations, which is often driven by the need to increase IT capacity. While making data centers as fireproof as possible can involve extra expense, the cost pales in comparison to the damage that could result from a serious fire that destroys data and mission-critical computer equipment. Experts suggest thinking of a data center as a "data island." It should be separate from other sections of the building, especially hazardous areas, and surrounded by fire-resistant construction, according to NFPA



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75, the National Fire Protection's "Standard for the Protection of Information Technology Equipment." The standard also addresses matters such as the types of materials that are acceptable in the computer room and how flooring should be constructed.<sup>23</sup>

Risk managers and loss control specialists may not always have a seat at the table when capital budget decisions are made, but studies have shown that an organizational champion can play an important role in promoting mitigation and risk awareness.<sup>24</sup> New construction offers the opportunity to incorporate superior design principles and construction materials, as well as state-of-the-art fire detection and protection systems. Decision-makers often can be influenced by advocates who can make well-reasoned arguments that the extra investment will pay dividends over the long-haul.

Having the correct insurance program in place can make a significant difference in the outcome of an event, whether a broken water pipe or a Category 5 hurricane. Hospitals represent enormously complex property exposures, requiring significant expertise on the part of brokers and underwriters to assure all property is insured at appropriate valuations. Policy enhancements specifically applicable to healthcare organizations can include decontamination expenses (including radioactive contamination), patient evacuation expenses, costs associated with suspension of operations due to communicable disease, and coverage for mobile medical equipment. Other related coverages that may be valuable to a hospital include equipment breakdown, spoilage malfunction and the property of others. Business interruption coverage is essential to assure the hospital's ability to survive if it is shut down by a disaster.

The pace of change in the healthcare sector seems unlikely to slow down anytime soon. Risk managers will continue to be challenged to address the property risk management and insurance implications of rapid transformation. One way risk managers can stay on top of these changes and respond effectively is to partner with brokers and insurers with expertise in healthcare and the resources to provide meaningful support to their hospital customers.

