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EC News

ENVIRONMENT OF CARE® | EMERGENCY MANAGEMENT | LIFE SAFETY

From TJC Department of Engineering

Advice for New Facilities Managers from an Experienced Health Care Professional

by Herman A. McKenzie, MBA, CHSP

FOCUS ON MANAGEMENT RESPONSIBILITIES, INCLUDING COMPLIANCE, AND TRUST STAFF TO DEAL WITH TECHNICAL ISSUES SUCH AS REPAIRS

August 2018 marked my 30th year in health care. During this time, I've had the pleasure of serving in different positions at hospitals and other health care institutions. In my current role as an engineer and now acting director of engineering in The Joint Commission's Standards Interpretation Group, I've developed a deep passion for assisting those who may be struggling with accreditation and compliance challenges.

With a background in biomedical/clinical engineering, I transitioned to facilities management after a dozen years in health care. Although I had a good understanding of maintenance management concepts, what I didn't realize until then is that the facilities manager plays a leading role in a Joint Commission–accredited organization's compliance with Environment of Care® (EC) and Life Safety (LS) standards.

To make the transition somewhat easier for today's new or aspiring facilities managers, I offer the following advice:

- **Don't get caught up in technical details.** New facilities managers who have a business background or a lot of experience in ancillary services have a natural tendency to focus on operations because operational issues constitute the most apparent and immediate tasks that define most days. Examples include daily repair requests, short- and long-range construction projects, and infrastructure initiatives.

  In contrast, facilities managers who do have strong facilities experience (and have worked their way up the career ladder due to exceptional technical skills) tend to concentrate on addressing specific technical issues, as opposed to developing management processes to make dealing with technical issues more effective and efficient.

  Rather than getting bogged down in operational or technical details, the best facilities managers are leaders. They create an environment in which staff can grow and improve their competencies. Managers need to focus on tasks that they and not their staff must undertake, such as strategic and operational planning, organizing the department, and managing the interactions between their department and others.

- **Understand the standards with which your facility must comply.** If you are part of a Joint Commission–accredited organization, it is important to get access to and understand the standards with which your facility must comply. Whether you're the facilities manager of a hospital, an ambulatory health care occupancy, or a nursing care center, you need to get up to speed on the standards and elements of performance (EPs) in the "Environment of Care" and "Life Safety" chapters of your institution's accreditation manual. Especially important are the EC sections on fire safety and utilities management, which are primarily driven by facilities professionals.

  Standards EC.02.03.01 and EC.02.03.03 describe how an organization must have a life safety (fire safety) management plan as well as a written fire response plan. These are two distinct plans. The management plan is more global, describing how the organization approaches fire safety. The written fire response plan provides details for how each area of the organization will respond in the case of a fire emergency. The response plan should also address how licensed independent practitioners (LIPs) will respond during this type of emergency and how staff will horizontally relocate if necessary. Along with the administrative requirement of having these documents, the facilities leader must ensure that fire drills are conducted in accordance with the requirements, which is once per quarter. Per EC.02.03.03, EP 1, when fire drills are conducted, they must be held at unexpected times and under varying conditions (at least one hour apart per quarter).

- **Prioritize testing of fire safety building features.** The importance of ensuring fire safety in health care settings cannot be overstated. Critical to fire safety is the responsibility of maintaining building features that provide smoke or fire detection and suppression. Standard EC.02.03.05 focuses on the specific components to be periodically tested. Facility managers must understand this standard and all the testing and required documentation that it entails.

  First, managers need to make sure that all devices are accounted for when reviewing previous testing cycles. For example, if the last testing cycle showed 70 detectors, the current cycle and successive cycles must show the same number, or you need to provide a written narrative for the difference in numbers. If a life safety surveyor notices that these numbers have not been reconciled, this will result in a deficiency finding.

  Fire detection and suppression devices are often tested by outside contractors rather than health care facility employees. When this is the case, the facilities manager must ensure that all the required information is contained in the contractor's report prior to accepting the final report. This requirement is addressed in EC.02.03.05, EP 28.

- **Conduct periodic rounds of all spaces for which you are accountable.** Creating rapport with your team and with internal customers in your organization is crucial for facilities management professionals. Facilities managers should conduct periodic rounds of all the spaces for which they are accountable. The acts of walking, looking, and listening will help you uncover many issues that need to be addressed, on top of helping to strengthen your relationships with those who report to you and with colleagues in other departments who interact with your team.

  When conducting rounds, pay a lot of attention to utilities management, an area prone to Joint Commission citations. As part of any utilities management program, your facilities team should make sure that shutoff points have been located and properly identified, including the area or zone that each shutoff controls. One of the top survey findings for the past few years has been the failure to label utility system controls to facilitate partial or complete emergency shutdowns—a requirement addressed in EC.02.05.01, EP 9. What often triggers the findings are electrical breaker panels with incorrect or incomplete legends.

  Under EC.02.05.01 are two additional frequently cited deficiencies. EPs 15 and 16 address maintaining the proper temperature, pressure differential, and humidity in critical and non-critical spaces, respectively. A key component in maintaining a safe environment is to ensure that clean spaces are in a positive pressure relationship to their adjacent areas. Conversely, spaces in which soiled processes take place must be in a negative pressure relationship to adjacent areas. Emphasis must be placed on maintaining these spaces, and the facilities manager must develop a process for ensuring compliance.

- **Address any problems uncovered by periodic inspections and maintenance.** Most health care organizations use a computerized maintenance management system (CMMS) to accurately monitor and document required periodic inspections, testing, and maintenance of equipment. (Please note that The Joint Commission does not require a CMMS.) Although a robust inspection program is necessary and most facilities managers are on top of this task, there are times when routine maintenance uncovers an issue that must be repaired. When this occurs, your maintenance program must quickly identify and address such problems. In other words, it's not enough to have a periodic maintenance program. Prompt and thorough follow-up to any deficiencies must be integral to your organization's maintenance culture.

These are just a few examples of the facilities manager's areas of responsibility. While these tips are aimed more at new managers, it is vital that all facilities management professionals continue to learn and grow throughout their careers to thrive in the ever-changing, always-challenging world of health care.

NEXT ↓

Danger Zone Directives

HOW HEALTH CARE ORGANIZATIONS CAN ESTABLISH EFFECTIVE HAZARDOUS MATERIALS AND WASTE MANAGEMENT PLANS

Hospitals, ambulatory care sites, and other health care facilities can be downright dangerous places considering all the harmful and risky chemicals, gases, sharps, specimens, cultures, drugs, and other substances contained, used, and discarded within.

Improper supervision, handling, and disposal of these items—including hazardous chemicals such as laboratory, sterilizing, and cleaning solutions; radioactive materials; chemotherapeutic drugs and other pharmaceuticals; medical gases and vapors; infectious materials that can transmit bloodborne pathogens; and medical waste—can lead to injury, illness, and death.

Hazardous materials and waste is one of six functional areas within the "Environment of Care" (EC) chapter for which Joint Commission–accredited facilities must develop a management plan. Devising and implementing a hazardous material and waste management plan are vitally important for these organizations, which must devote careful planning to institute and maintain this plan.

"Once these hazardous substances come through the door at your facility, and until they go out the door through waste hauling and are properly disposed of, you are responsible for them," says Kenneth "Beau" Hébert, MAOM, CHS, CHEP, an engineer with The Joint Commission's Standards Interpretation Group (SIG). "A thorough management plan is your organization's means of ensuring the safe and appropriate control and handling of these harmful substances."

A management plan addressing hazardous materials and waste should outline who is responsible for what, when the necessary steps are undertaken (in the event of a spill or leak, for example), and what procedures the organization is following to accomplish these steps, says Herman A. McKenzie, MBA, CHSP, the acting director of engineering for SIG.

"Ultimately, the goal of implementing an efficacious hazardous materials and waste management plan is to provide a safe environment for patients, staff, and visitors within your facility and to minimize any negative impact to the ecological environment outside your facility," McKenzie adds.

What's required

Fortunately, The Joint Commission has created a reliable guide in the form of standard EC.02.02.01 and its elements of performance (EPs), which, if followed properly, can help an organization accomplish the aforementioned goal. (*See* "Related Environment of Care Requirements" on page 8.)

"The Joint Commission requires that each of these elements of performance be addressed in your management plan," says Hébert. "In my previous position as the environment of care manager at a hospital, I used these EPs as the outline for my hazardous materials and waste management plan."

McKenzie notes that the US Occupational Safety and Health Administration (OSHA), the US Environmental Protection Agency (EPA), and other federal agencies as well as state agencies do not require any particular type of management plan overall. (More narrowly focused plans such as OSHA's Chemical Hygiene Plan are spelled out in more detail, however.) Consequently, abiding by EC.02.02.01 should satisfy these regulatory bodies.

But health care facilities may be obligated to comply with external reporting rules enforced by their state emergency response commission, which may require periodic reporting of hazardous products. In addition, the local emergency planning committee (LEPC) and/or fire department may enforce local reporting requirements related to the handling of hazardous products or hazardous material inventory quantities.

What's more, health care organizations must have the necessary permits, manifests, licenses, and Safety Data Sheets (SDSs) and must maintain compliance with laws concerning these items. Health care facilities also need to conform to US Nuclear Regulatory Commission (NRC) requirements related to special hazards associated with the management of radioactive materials and hazardous energy sources.

Taking stock of harmful items

All health care organizations must regularly take inventory of a facility's hazardous materials to ensure that any such products on premises are properly accounted for and that outdated or unneeded chemicals are eliminated.

Maintaining a comprehensive list of the materials present in a facility also helps inform health care employees about hazardous materials to which they may be exposed, in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200), which incorporates the Globally Harmonized System for Classification and Labeling of Chemicals. The Joint Commission requires that any hazardous material or


OSHA® QUICK CARD™

Hazard Communication Standard Labels

OSHA has updated the requirements for labeling of hazardous chemicals under its Hazard Communication Standard (HCS). As of June 1, 2015, all labels will be required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is shown on the right. Supplemental information can also be provided on the label as needed.

For more information:

OSHA Occupational Safety and Health Administration (800) 321-OSHA (6742) www.osha.gov

SAMPLE LABEL

Product Identifier

Supplier Identification

Hazard Pictograms

Signal Word
Danger

Hazard Statements

Precautionary Statements

Supplemental Information

waste that is regulated by federal, state, or local laws (including OSHA, EPA, NRC, US Department of Transportation, and US Drug Enforcement Administration regulations) be part of this inventory.[1]

"Creating and maintaining an inventory is one of the first components involved in a successful management plan," says Hébert, who adds that the inventory is often completed by an appointed coordinator or an assigned person from each department. Soon after, the health care organization's EC committee should review it for thoroughness, and the inventory should be submitted to the appropriate federal, state, and local agencies as required by law.

"Your plan should define how the inventory will be conducted, what constitutes a hazardous material [per federal, state, and local regulations], what information is required to be included in the inventory, and who is responsible for conducting it," says McKenzie.

Some health care organizations maintain a central single comprehensive inventory, often compiled into a spreadsheet.[2] Other health care organizations have more comprehensive lists organized by department or even subdivided into specific areas within the department—often in the form of an electronic database. The Joint Commission does not define what is required.

What else is involved?

A good management plan involves several procedures in addition to keeping an inventory, including those related to staff training and the handling, labeling, storage, transportation, use, generation, monitoring, disposal, and documentation of hazardous materials and waste. Some of these procedures, such as disposal, may be handled by contracted external services. Regardless of who fulfills these duties, the health care organization is responsible for making sure they are done properly and in accordance with Joint Commission standards and all pertinent regulations.

In addition, The Joint Commission requires that the management plan address risk assessment; staff development; emergency response and procedures; inspection, testing, and maintenance; information collection and evaluation; performance monitoring; and annual evaluation.

"Your management plan process should also determine the safety precautions and training that will be needed once a harmful substance is brought into the facility," Hébert says. "All products should be screened prior to being ordered to assess whether other things will be required due to any inherent safety concerns, such as using a neutralizer when disposing of the product or accommodating additional air exchange rates in the space where the product will be used."

Related Environment of Care Requirements

The elements of performance (EPs) discussed in this article are presented here in their entirety. This list does not include all the EPs for standards EC.02.02.01, EC.01.01.01, or EC.04.01.01. Check your facility's accreditation manual for all applicable EPs.

Standard EC.02.02.01

The organization manages risks related to hazardous materials and waste.

EP 1: The organization maintains a written, current inventory of hazardous materials and waste that it uses, stores, or generates. The only materials that need to be included on the inventory are those whose handling, use, and storage are addressed by law and regulation. (*See also* IC.02.01.01, EP 6; MM.01.01.03, EP 3).

EP 3: The organization has written procedures, including the use of precautions and personal protective equipment, to follow in response to hazardous material and waste spills or exposures.

EP 4: The organization implements its procedures in response to hazardous material and waste spills or exposures. (*See also* IC.02.01.01, EP 2)

EP 6: The organization minimizes risks associated with selecting, handling, storing, transporting, using, and disposing of radioactive materials.

EP 8: The organization minimizes risks associated with disposing of hazardous medications. (*See also* MM.01.01.03, EPs 1 and 2).

EP 9: The organization minimizes risks associated with selecting, handling, storing, transporting, using, and disposing of hazardous gases and vapors.

Note: *Hazardous gases and vapors include, but are not limited to, ethylene oxide and nitrous oxide gases; vapors generated by glutaraldehyde; cauterizing equipment, such as lasers; waste anesthetic gas disposal (WAGD); and laboratory rooftop exhaust.*
(For full text, refer to NFPA 99-2012: 9.3.8; 9.3.9)

EP 11: For managing hazardous materials and waste, the organization has the permits, licenses, manifests, and safety data sheets required by law and regulation.

EP 12: The organization labels hazardous materials and waste. Labels identify the contents and hazard warnings. (*See also* IC.02.01.01, EP 6)

EP 17: For organizations that provide computed tomography (CT), positron emission tomography (PET), nuclear medicine (NM), or fluoroscopy services: The results of dosimetry monitoring are reviewed at least quarterly by the radiation safety officer, diagnostic medical physicist, or health physicist to assess whether staff radiation exposure levels are "as low as reasonably achievable" (ALARA) and below regulatory limits.

Note 1: *For the definition of ALARA, please refer to US Nuclear Regulatory Commission federal regulation 10 CFR 20.1003.*

Note 2: *This element of performance does not apply to dental cone beam CT radiographic imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to obtain guidance for the treatment of such conditions.*

Standard EC.01.01.01

The organization plans activities to minimize risks in the environment of care.

Note 1: *One or more persons can be assigned to manage risks associated with the management plans described in this standard.*

Note 2: *For organizations that use Joint Commission accreditation for deemed status purposes: The organization complies with the 2012 edition of NFPA 99: Health Care Facilities Code. Chapters 7, 8, 12, and 13 of the Health Care Facilities Code do not apply.*

Note 3: *For further information on waiver and equivalency requests, see https://www.jointcommission.org/life_safety_code_information_resources/ and NFPA 99-2012: 1.4.*
EP 6: The organization has a written plan for monitoring the following: hazardous materials and waste.

Standard EC.04.01.01

The organization collects information to monitor conditions in the environment.

EP 1: The organization establishes a process(es) for continually monitoring, internally reporting, and investigating the following:

- Injuries to patients or others within the organization's facilities
- Occupational illnesses and staff injuries
- Incidents of damage to its property or the property of others
- Security incidents involving patients, staff, or others within its facilities
- Hazardous materials and waste spills and exposures
- Fire safety management problems, deficiencies, and failures
- Medical or laboratory equipment management problems, failures, and use errors
- Utility systems management problems, failures, or use errors

Note 1: *All the incidents and issues listed above may be reported to staff in quality assessment, improvement, or other functions. A summary of such incidents may also be* shared with the person designated to coordinate safety management activities.

Note 2: *Review of incident reports often requires that legal processes be followed to preserve confidentiality. Opportunities to improve care, treatment, or services, or to prevent similar incidents, are not lost as a result of following the legal process.*
Based on its process(es), the organization reports and investigates the following:

EP 3: Injuries to patients or others in the organization's facilities.

EP 4: Occupational illnesses and staff injuries.

EP 5: Incidents of damage to its property or the property of others.

EP 6: Security incidents involving patients, staff, or others within its facilities.

EP 8: Hazardous materials and waste spills and exposures.

EP 9: Fire safety management problems, deficiencies, and failures.

EP 10: Medical/laboratory equipment management problems, failures, and use errors.

EP 11: Utility systems management problems, failures, or use errors.

EP 15: Every 12 months, the organization evaluates each environment of care management plan, including a review of the plan's objectives, scope, performance, and effectiveness.

Other action steps

To create an effective management plan, hospitals and ambulatory health care facilities can follow these best-practice recommendations:

- **Assign a management plan leader.** "Choose someone to be the point person to manage your organization's hazardous materials and waste," Hébert says. "Often at hospitals, laboratorians fit this role well due to their extensive training; other times, a pharmacist, a safety officer, or an EC director is given this responsibility."
- **Create a subcommittee of the EC committee to address issues related to hazardous materials and waste.** For hospitals, members of this committee

could include the organization's decontamination team leader as well as one representative from each of the following departments: laboratory, pharmacy, purchasing, radiology, environmental services, safety management, and education.

- **Conduct an environmental tour to assess risks.** Review product labels and SDSs carefully to identify risk sources. This tour can also be used to select less hazardous materials.
- **Develop and enforce an organizationwide hazardous materials and waste management policy.** Standard EC.01.01.01, EP 6 requires a hazardous materials and waste management plan.

Online Resources

- Learn the Basics of Hazardous Waste (EPA): epa.gov/hw/learn-basics-hazardous-waste
- Hazardous Material - Waste Inventory Program (The Joint Commission): tinyurl.com/hazmatjcr
- Hazard Identification Training Tool (OSHA): osha.gov/hazfinder/index.html
- Hazardous Materials/Hazardous Waste Management Plan (Santa Monica–UCLA Medical Center): tinyurl.com/hazmatucla
- Environment of Care Hazardous Materials and Waste Management Plan (Jefferson University Hospitals): tinyurl.com/hazmatjeff
- Hazardous Materials Management Plan (University of Colorado Denver/Anschutz Medical Campus): tinyurl.com/hazmatdenver

- **Provide safety training to staff.** Educate employees on how to recognize the presence of hazardous materials and waste; dispose of such materials properly; find and use labels, personal protective equipment, eye wash stations, and spill kits; and notify the right authorities to respond to a spill or other hazardous material emergency. Repeat and update this training annually or when you change products, and aim to conduct a yearly biohazard drill/exercise.
- **Establish an EC rounding checklist.** "This allows your subcommittee to periodically survey for compliance throughout the facility and gather data," suggests McKenzie. It also helps determine what the organization is doing correctly or not correctly."
- **Review employee and patient exposure injury reports and other occurrence reports.** The Joint Commission requires these reports per standard EC.04.01.01, EPs 1–11. (*See* "Related Environment of Care Requirements" on page 9.)
- **Partner with vendors.** "Ask your waste removal vendor, for example, to provide training to your staff and request input on how your team can improve the waste removal process," McKenzie says.
- **Review and update the management plan annually.** It's important to ensure that the plan is accurate and effective.

Safety is the first priority

The lesson to be learned here is simple. "Many safety and compliance risks are associated with the handling of hazardous materials and waste, which could put your organization in jeopardy if mishandled," says Hébert. "The repercussions of failing to follow the rules include injury to people, harm to the environment, and negative publicity that could devastate your organization."

Pharmaceutical waste issues—a top priority

From cancer chemotherapy drugs to pharmaceuticals that pose reproductive risks, medications are among the most commonly used hazardous materials in a health care facility. Properly storing, using, and disposing of these pharmaceuticals should be a top priority to safeguard patients, staff, and visitors alike.

"But it is also important that organizations consider the environmental impact of pharmaceutical waste and avoid costly fines," says Robert Campbell, PharmD, director of The Joint Commission's Clinical Standards Interpretation Group and Medication Management. It's critical that organizations monitor their waste to ensure that they do not exceed thresholds for US Environmental Protection Agency (EPA) waste generator status, which would affect waste management requirements, he adds.

Campbell notes that organizations sometimes struggle to identify hazardous pharmaceutical products, which can easily lead to noncompliance with EPA waste stream requirements.

Types of hazardous drugs

On its website, the United States Pharmacopeial Convention references the National Institute for Occupational Safety and Health (NIOSH) publication *NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings, 2016* https://www.cdc.gov/niosh/docs/2016-161/pdfs/2016-161.pdf). NIOSH classifies hazardous medications into three groups:

- Group 1—antineoplastic drugs (used to fight cancer)
- Group 2—non-antineoplastic hazardous drugs that meet one or more NIOSH criteria (such as immunosuppressants and certain hormone therapy drugs)
- Group 3—drugs that primarily pose a threat to reproduction

NIOSH urges health care professionals to read pharmaceutical manufacturer package inserts to learn about the hazards of newer medications. Other resources include manufacturers' Safety Data Sheets and guidelines published by the American Society of Health System Pharmacists.

Waste stream management

"Organizations are required by the EPA to determine their waste generator status based on the quantity of hazardous product produced in a time period," Campbell says. "In most cases, this status drives the requirements for waste stream.

"However, some water management municipalities will also test waste water of organizations to identify patterns or concerning levels of products, which could have an impact on waste water runoff."

To better manage these substances, Campbell recommends using an automated drug cabinet or electronic medical records to identify those medications that are subject to special disposition requirements.

"Some organizations have also placed a special code in the medication name, such as 'H,' to alert clinicians to the medications requiring special disposition," Campbell says. "Others have used auxiliary labels to be placed on these products. If external labeling is used, the organization should ensure that this labeling is not done in a way that would create concern for the patient or his or her family."

For instance, if a sticker on a container says "CAUTION: HAZARDOUS MATERIAL," a nurse might well get some pushback when trying to administer the medication to a patient.

Health care facilities need to be aware, as well, that the EPA recently enacted its final rule regarding management standards for hazardous waste pharmaceuticals. Among the new regulations, health care organizations are now prohibited from disposing of hazardous waste pharmaceuticals down the drain. In addition, the dual regulation of Resource Conservation and Recovery Act (RCRA) hazardous waste pharmaceuticals that are also US Drug Enforcement Administration–controlled substances has been eliminated. Moreover, certain US Food and Drug Administration–approved over-the-counter nicotine replacement therapies are now excluded from regulation as hazardous waste.[1]

Reference

1. US Environmental Protection Agency. Final Rule: Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine. Accessed March 21, 2019. https://www.epa.gov/hwgenerators/final-rule-management-standards-hazardous-waste-pharmaceuticals-and-amendment-p075.

New and emerging risks associated with the handling of highly infectious and other extremely hazardous materials continue to arise and provide fresh challenges to health care organizations as well.

"Consider, for instance, the Ebola scare a few years ago that required staff to handle personal protective equipment differently and more carefully than what they were used to," Hébert notes. "A special Ebola PPE waste-handling process had to be developed and staff instructed. This is yet another reason that creating and regularly updating a management plan for hazardous materials waste is essential."

References

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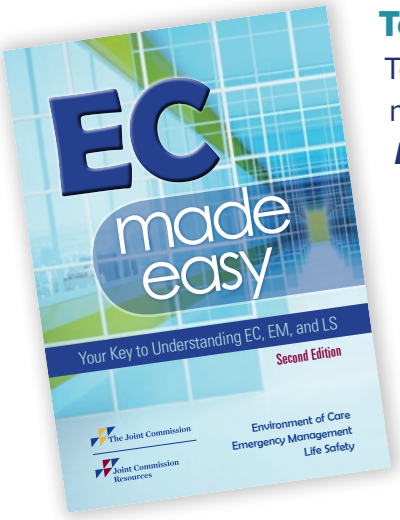
2. Joint Commission Resources. *EC Made Easy: Your Key to Understanding EC, EM, and LS*, 2nd edition. Aug 2017. https://www.jcrinc.com/ec-made-easy-your-key-to-understanding-ec-em-and-ls-2nd-edition/



To learn more

To learn more about managing hazardous materials and waste, read Chapter 5 of the book ***EC Made Easy: Your Key to Understanding EC, EM, and LS***, 2nd edition, published by Joint Commission Resources (JCR). The book can be ordered from the JCR webstore at https://www.jcrinc.com/ec-made-easy-your-key-to-understanding-ec-em-and-ls-2nd-edition.

NEXT

Under Pressure: Handling and Storing Medical Gas Safely

BE SURE TO INDIVIDUALLY SECURE CYLINDERS, SEGREGATE AND LABEL EMPTY ONES, AND ENSURE EASY ACCESS TO SHUTOFF VALVES FOR PIPED GAS SYSTEMS

Medical gases may not be visible, but their impact is seen on nearly all patients in hospitals and in other health care occupancies.

That impact will continue to grow as increasing rates of chronic diseases—especially respiratory conditions such as chronic obstructive pulmonary disease (COPD)—in the aging population result in more and more patients being hospitalized. Around 60% of Americans have at least one chronic disease such as cancer, diabetes mellitus, or heart disease, and 40% suffer from two or more chronic conditions.

The US Food and Drug Administration (FDA) reports that it receives information from nursing homes and hospitals suggesting an average of approximately one death and two injuries per year involving improper handling of portable cryogenic containers and high-pressure medical gas cylinders. But the agency estimates that the number of incidents is actually higher because these health care facilities are not required to report the incidents to the FDA.

With medical gas providing oxygen to patients, powering surgical equipment, and removing waste through medical vacuum systems, it's vitally important that health care facilities safely manage piped medical gas systems, along with safely storing and handling medical gas cylinders. But basic practices like labeling and separating full and empty cylinders can sometimes get lost in the shuffle of day-to-day tasks, says Herman A. McKenzie, MBA, CHSP, acting director of engineering for The Joint Commission's Standards Interpretation Group.

Medical gas storage and handling is guided by the 14 elements of performance (EPs) of Joint Commission standard EC.02.05.09: The organization inspects, tests, and maintains medical gas and vacuum systems.

Frequently cited EP 12, for instance, requires the physical segregation of full and empty cylinders from each other to assist staff in selecting the proper cylinder. (*See* "Related Environment of Care Requirements" on page 14.)

"The standard's requirements reflect an understanding of human nature," McKenzie notes. "In an emergency, for example, someone might grab an oxygen tank in a hurry and take it wherever it's needed. That person could inadvertently grab an empty cylinder, which is why the standard requires segregating empty and full cylinders."

Related Environment of Care Requirements

This list includes commonly cited elements of performance (EPs) for Standard EC.02.05.09 in their entirety, but it is not a complete list of all 14 of the standard's EPs. Check your facility's accreditation manual for applicable EPs.

Standard EC.02.05.09

The organization inspects, tests, and maintains medical gas and vacuum systems.

Note: *This standard does not require organizations to have the medical gas and vacuum systems discussed below. However, if a facility has these types of systems, then the following inspection, testing, and maintenance requirements apply.*

EP 1: Medical gas, medical air, surgical vacuum, waste anesthetic gas disposal (WAGD), and air supply systems in which failure is likely to cause major injury or death are designated as follows:

- Category 1: Systems in which failure is likely to cause minor injury to patients
- Category 2: Systems in which failure is not likely to cause injury, but can cause discomfort to patients
- Category 3: Deep sedation and general anesthesia are not administered when using a Category 3 medical gas system.

(For full text, refer to NFPA 99-2012: 5.1.1.1; 5.2.1; 5.3.1.1; 5.3.1.5; 5.1.14.2)

EP 2: All master, area, and local alarm systems used for medical gas and vacuum systems comply with the category 1–3 warning system requirements. (For full text, refer to NFPA 99-2012: 5.1.9; 5.2.9; 5.3.6.2.2)

EP 4: Locations containing only oxygen or medical air have doors labeled "Medical Gases: NO Smoking or Open Flame." Locations containing other gases have doors labeled "Positive Pressure Gases: NO Smoking or Open Flame. Room May Have Insufficient Oxygen. Open Door and Allow Room to Ventilate Before Opening."

EP 5: A precautionary sign readable from 5 feet away is on each door or gate of a cylinder storage room, where the sign, at a minimum, includes the wording "CAUTION; OXIDIZING GAS(ES) STORED WITHIN. NO SMOKING." Storage is planned so cylinders are used in the order they are received from the supplier. Only gas cylinders and reusable shipping containers and their accessories are permitted to be stored in rooms containing central supply systems or gas cylinders.

EP 8: When the organization has bulk oxygen systems above ground, they are in a locked enclosure (such as a fence) at least 10 feet from vehicles and sidewalks. There is permanent signage stating "OXYGEN – NO SMOKING – NO OPEN FLAMES."

Note: *For additional guidance, refer to NFPA 99-2012: 5.1.3.5.12.*

EP 11: The organization makes main supply valves and area shutoff valves for piped medical gas and vacuum systems accessible and clearly identifies what the valves control. Piping is labeled by stencil or adhesive markers identifying the gas or vacuum system, including the name of system or chemical symbol, color code (*see* NFPA 99-2012: Table 5.1.11), and operating pressure if other than standard. Labels are at intervals of 20 feet or less and are in every room, at both sides of wall penetrations, and on every story traversed by riser. Piping is not painted. Shutoff valves are identified with the name or chemical symbol of the gas or vacuum system, room or area served, and caution to not use the valve except in emergency. (For full text, refer to NFPA 99-2012: 5.1.4; 5.1.11.1; 5.1.11.2; 5.1.14.3; 5.2.11; 5.3.13.3; 5.3.11)

EP 12: The [organization] implements a policy on all cylinders within the [facility] that includes the following:

- Labeling, handling, and transporting (for example, in carts, attached to equipment, on racks) in accordance with NFPA 99-2012: 11.5.3.1 and 11.6.2

- Physically segregating full and empty cylinders from each other in order to assist staff in selecting the proper cylinder
- Adaptors or conversion fittings are prohibited
- Oxygen cylinders, containers, and associated equipment are protected from contamination, damage, and contact with oil and grease
- Cylinders are kept away from heat and flammable materials and do not exceed a temperature of 130°F
- Nitrous oxide and carbon dioxide cylinders do not reach temperatures lower than manufacturer recommendations or -20°F
- Valve protection caps (if supplied) are secured in place when cylinder is not in use
- Labeling empty cylinders
- Prohibiting transfilling in any compartment with patient care

(For full text, refer to NFPA 99-2012: 11.6.1; 11.6.2; 11.6.5; 11.7.3

Some of the most common citations for medical gas cylinders—including inadequate labeling, improper storage practices, blocked access, and unsecured cylinders—stem from staff "not knowing what they didn't know," observes James Kendig, MS, CHSP, CHCM, CHEM, LHRM, field director of surveyor management for The Joint Commission's Division of Accreditation and Certification Operations. In other words, staff members frequently are unaware of the scope of the standard.

Kendig says he has seen a copier stationed in front of a medical gas valve because that location was erroneously viewed as a convenient empty space. He also has observed cylinders left unattended and unsecured in a soiled utility room because someone evidently wasn't knowledgeable about the requirements, decided to ignore them, or became distracted by other matters.

"Some of the careless things people do sometimes are just propping up the cylinder, not securing it in a proper holder, or just laying the cylinder on top of a cart where it can roll off," McKenzie adds.

Unsecured cylinders can be a recipe for disaster, Kendig emphasizes, recommending that each cylinder be individually secured as opposed to chaining several cylinders together. Cylinders that tip over could injure someone; and if part of a valve assembly were to break off on impact, it could become a dangerous projectile, he warns.

While he has noted many problems, Kendig has also encountered innovative and resourceful cylinder securement solutions. "For example, I've seen amazing solutions where welders or carpenters built a rack on site to hold individual H-type cylinders in an outside enclosure, using pull-downs for securing the cylinders."

To keep cylinders safely stored, McKenzie recommends this tip, which is not a Joint Commission requirement: **Designate a staff member familiar with the EC gas storage requirements to monitor the cylinder storage area regularly**.

Unsecured, unlabeled medical gas cylinders are left unattended in a utility room, an egregious safety violation.
Photo: Courtesy of James Kendig

Placing a photocopier in front of medical gas zone valves is a clear violation of EC.02.05.09, EP 11, which requires that such valves be accessible.
Photo: Courtesy of James Kendig

At this facility, medical gas zone valves are situated behind a door, rendering them inaccessible—another violation of EC.02.05.09, EP 11.
Photo: Courtesy of James Kendig

"This person could have a checklist and go through the space every day—or twice a day or once per shift—to make sure everything is in order: no comingling of empty and full cylinders, the right amount of spares, correct labeling, et cetera," he explains.

Consider color-coding a storage rack to make it easy for staff to see immediately what the mix is of full, partially full, and empty cylinders, Kendig suggests, citing a good practice he has observed. "Some organizations have painted racks green for fulls, yellow for partially full cylinders, and red for empties," he says.

Valves get the all-clear

Blocked access and labeling problems are also among the top issues for piped medical gas systems, says McKenzie. Standard EC.02.05.09, EP 11 requires that main supply valves and area shutoff valves for piped medical gas and vacuum systems be accessible and clearly identify what the valves control. The Joint Commission does not specify how much area must be clear around the valve, but many facilities maintain at least 3 feet of clearance.

"Life safety surveyors will cite for blocked access to zone valves even if [the blocking object] is not a permanent fixture," McKenzie explains. "A gurney or a laundry cart placed in front of a shutoff valve would be considered blocking the valve."

What's more, valves that are not labeled clearly could cost precious time if an emergency shutoff is needed, Kendig points out. "Sometimes the staff struggles to reconcile the room numbers with the [valve] labeling so they can see what medical zone the valve actually controls," he says.

In addition, staff should be trained to know who is authorized to shut off medical gas valves. Signage that provides the name of a specific authorized staff position, such as a charge nurse, in addition to a phone number to call during an emergency or when there is a leaking valve, is an effective way to reinforce this information, says Kendig. (Note that this is a good practice, not a Joint Commission requirement.)

Kendig also points to unsafe practices involving alarm systems that have the potential to pose immediate threats to patient and staff safety.

"We've seen facilities that have not hooked up the piped medical gas system to the alarm system, where nobody would know if they ran out of gases unless they had the medical gas system hooked up to some other equipment [that was connected with the alarm system]," he explains. "Other problems include silencing alarms or not replacing light bulbs in the alarms."

Taking basic day-to-day precautions when working with cylinders and piped systems is key to enabling medical gas to play its important role in treating patients without endangering either their safety or the safety of health care staff. EC

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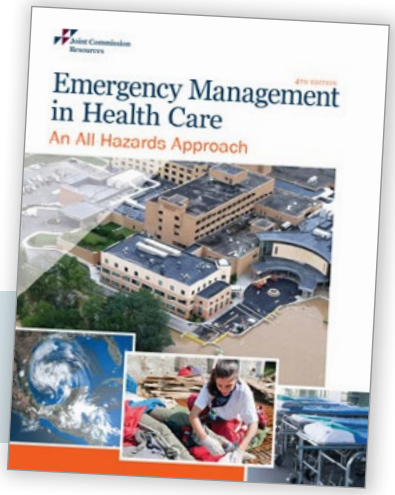
Ambulatory Care

Building an Emergency Management Program from the Ground Up



USING ITS GOUVERNEUR FACILITY AS A MODEL, NYC HEALTH + HOSPITALS INSTITUTED CONSISTENT AND ROBUST HAZARD VULNERABILITY ANALYSIS METHODOLOGY SYSTEMWIDE

The following is an excerpt from the forthcoming book, Emergency Management in Health Care: An All Hazards Approach, *4th edition. Published by Joint Commission Resources (JCR), the book can be ordered online from the JCR webstore at https://www.jcrinc.com/emergency-management-in-health-care-an-all-hazards-approach-4th-edition/. This case study was originally based on a presentation at the 2018 JCR Emergency Preparedness Conference in Orlando, Florida, by Daniel Meisels, MPA, CHFM, CEM, NHDP-BC.*

With the institution of the Centers for Medicare & Medicaid Services (CMS) final rule on emergency preparedness, many health systems and organizations with ambulatory care components have had to think in new ways and build up new programs to bring ambulatory care facilities into compliance.

NYC Health + Hospitals is one such system. A large unified health system serving New York City, NYC Health + Hospitals comprises 11 hospitals, more than 60 primary care centers, a home health agency, and more. The organization has an Emergency Management Office, which functions primarily as a coordinating resource, facilitating exercises and sharing information.

Each facility in the system is responsible for its own emergency management (EM) program, and issues of compliance and accreditation are left to each individual entity. The hospitals and long-term care facilities were all Joint Commission–accredited and, thus, had their own EM programs and emergency operations plans (EOPs) based on site-specific expertise. These facilities were given resources to fund and operate those programs by the health system and through grants from the US Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response (ASPR).

The ambulatory care centers in the health system, on the other hand, were not accredited and by and large had no existing EM programs, no resources to fund them, no ASPR grants, and little or no organizational or leadership experience in emergency planning and response.

Don't reinvent the wheel

Fortunately, NYC Health + Hospitals had some resources to draw on. NYC Health + Hospitals Gouverneur is the largest diagnostic and imaging center in New York State. It is located in a new and recently modernized facility in Manhattan, and it

shares that building with a 295-bed Joint Commission–accredited skilled nursing facility. That skilled nursing facility had an emergency management team and program in place. The EM program for the skilled nursing facility covers the entire facility and applies to the ambulatory care service line.

Using Gouverneur as a model and using the site's staff as a resource, NYC Health + Hospitals emergency management team set up some basic expectations and deadlines and tasked leadership at each of the ambulatory care sites to develop a site-specific EOP.

Some difficulties remained. Some sites had vacancies in their leadership, and it was not always clear to leaders unaccustomed to thinking about emergency management who the appropriate stakeholders were to include in planning activities. So, the Emergency Management Office provided a template for ambulatory care emergency management that was consistent with the systemwide incident command structure and mandated Incident Command System (ICS) training for all new leaders.

In practice, the template created from the Gouverneur plan proved somewhat too complex for those new to EM planning issues. The health system reached out to the Community Health Care Association of New York State (CHCANYS) to obtain a simpler template that used ambulatory care–specific resources. This model emphasized frequent communication and collaboration with CHCANYS and other agencies, as well as law enforcement and local emergency management authorities.

Many of the health system's ambulatory care sites had not done a hazard vulnerability analysis (HVA) or had not reviewed their HVA in years. Across the system, HVA methodology was inconsistent, and it often focused only on actual events, not on potential hazards. In response, the Emergency Management Office conducted an HVA workshop and introduced a standard HVA model.

Leadership set deadlines for key elements of plan development, with the health system's EM coordinator providing assistance and expertise where needed. The Emergency Management Office helped create standardized training modules for leadership and frontline staff.

The results

By the time the new CMS emergency preparedness rule came into effect on November 15, 2017, NYC Health + Hospitals had new EOPs and HVAs in place at each of its ambulatory care sites. Standardized appendices to these plans included local fire safety plans, communications resources, and training modules. And a multiyear training and exercise plan was developed to assist ongoing evaluation and improvement.

In previous years, drills at ambulatory care sites were often limited to fire drills and not coordinated with any sort of HVA. Now, in contrast, ambulatory care sites are integrated into larger EM exercises involving multiple facilities, including NYC Health + Hospital's full-scale Special Pathogens Exercise.

NYC Health + Hospitals has brought emergency management into the consciousness of ambulatory care leaders in the health system. The organization has created a framework to support emergency preparedness in its ambulatory care network, including standardized emergency operations planning and hazard vulnerability analysis. Although there are still challenges ahead, including the constant challenge of competing priorities and some issues with lack of awareness or understanding of the critical issues and survey process, this health care system has provided an EM program for ambulatory care where none existed before with just a modest outlay of time and resources.

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What's Your Solution?

Readers Are Invited to Share Their Solutions to Common Compliance Challenges

The Joint Commission sets standards and elements of performance with which organizations must comply, but it's up to Joint Commission–accredited facilities to determine the best way to comply with them and to identify their own solutions. Beginning with the January 2019 issue, *EC News* has been encouraging readers to share how their facilities address particular requirements or compliance challenges.

This month, we are asking another question. Readers are encouraged to provide their answers and insights by emailing executive editor Carolyn Schierhorn at cschierhorn@jcrinc.com. Please put the specific "What's Your Solution?" question in the subject line of the email. The best solutions will be published in future issues of *EC News*.

Controlling humidity can be a challenge in an older facility that lacks a built-in system for monitoring and managing water vapor in various settings. How does your organization maintain appropriate humidity levels in spaces that are especially sensitive to moisture, such as operating rooms (ORs), sterile storage areas, and laboratories?

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