

# Protect Residents, Staff, and Workers With a Blueprint for Construction Safety

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*ECRI Institute and Annals of Long-Term Care: Clinical Care and Aging (ALTC) have joined in collaboration to bring ALTC readers periodic articles on topics in risk management, quality assurance and performance improvement (QAPI), and safety for persons served throughout the aging services continuum. ECRI Institute is an independent nonprofit that researches the best approaches to improving health care.*

If a restaurant needs reconstruction, it might close for a month. A school can start building a new wing over the summer. Even a home renovation can be scheduled at the owner's convenience. However, there is no such thing as a "convenient" time for construction in a long-term care facility. Facilities by their nature are open 24 hours a day, 7 days a week. It is a near certainty that construction will occur while resident care activities are ongoing. Thus, everything from the noise generated by a hammer to the route a carpenter takes to get lunch must be taken into account before construction can begin.

## Assemble a Construction Safety Team

Before construction begins, facilities should assemble their own multidisciplinary construction safety team. Although the staffing requirements will vary according to the size, location, and complexity of the project, the following personnel should be considered:

- Administration representatives
- Contractors
- Environmental safety staffers
- Facilities director
- Industrial hygienists
- Infection control personnel
- Occupational health workers
- Resident safety officer
- Risk management
- Security personnel

This team should be formed during preconstruction planning stages, and it should remain involved throughout the entire project. The facility should establish a regular forum for this team to communicate with each other.

A representative from the construction crew or contractor should provide the committee with an overview of the

project's plans and what risks it may pose, as well as daily updates to team members.

Even if the facility hires an outside contractor, a project manager within the facility should be responsible to the organization for all aspects of the project, including compliance with safety standards. This individual should review every part of the project with the architect, engineer, and contractor before the site assessment takes place.

Before construction begins, this individual should also ensure that material safety data sheets have been handed out and that staff, including visiting construction workers, are aware of Occupational Safety and Health Administration's (OSHA's) Hazard Communication Standard.<sup>1</sup>

## Create a Construction Communication Plan

It is important to communicate to all building occupants, including construction workers, staff, and visitors, about ongoing construction activities. If the construction crew knows in advance that their activities may produce unusual sounds, vibrations, or odors, they should alert the construction safety team liaison, who can alert all facility staff to avoid panic.

Every communication plan should include procedures for communicating critical messages that if left unheard or misunderstood could create a hazard for building occupants. For example, a scheduled power interruption, if not properly communicated in advance, could lead to disaster. This is why it is imperative not only to transmit the information about a change, but also to have the recipient acknowledge and repeat back the information.

Care providers in resident care areas must be able to reach the construction crew to implement emergency stop procedures. Construction activity can affect floors above or below or units left and right, and its impact may be felt on distant sides of the building. It is also important to have in place a

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procedure to restart construction activities. Safety comes first, but precious hours could be lost while a construction crew waits to get the all clear to begin again, costing valuable time and money.

Similarly, construction can also have an effect on care staff health and safety. For example, in the past, a hospital reached out to ECRI Institute reporting that nurses had been complaining of severe headache, lethargy, nausea, sore throat, and burning eyes. After investigation, the culprit was revealed to be an exhaust vent that had been dislodged in a radiology room during renovation. Noxious chemical fumes were drifting up to the floor above where the nurses breathed them in, thanks to holes in the cement floor that had been concealed by cabinetry. The solution was to reconnect the ductwork and seal the holes in the floor.<sup>2</sup>

Just as it is essential to train medical staff that they will not be penalized for reporting adverse events, it is essential that those participating in constructive activities know they will not be punished or penalized for reporting a safety error. At a busy construction site, everyone must check and advocate for safety.

## Conduct Daily Safety Huddles

A facility representative should meet with the contractor and his or her team for a daily safety huddle. These meetings can be brief, perhaps 5 minutes, and occur before construction starts. At this time, all levels of workers on the project should be reminded that the primary goal is safety. Care workers can also discuss concerns they have. Job safety haz-

ards should be identified and reiterated, newly discovered safety hazards from the previous day should be discussed, and the group can talk about the work planned for that day. Special consideration should be given in the daily safety huddle if a task that day, such as demolition, could have an extra impact on resident safety.<sup>3</sup>

Organizations should consider developing a checklist for the daily safety huddle that can be completed and kept as part of the project documentation and safety record. This checklist could include considerations for the following<sup>4</sup>:

- Permits, signs, and barricades that may be needed before starting certain tasks that day.
- Availability and locations of personal protective equipment (PPE) and emergency equipment.
- Identification of whether training or certifications are required to perform certain tasks, such as lockout/tag-out procedures.
- Identification and location of potential hazards for the day's tasks and the methods of hazard control that will be implemented.
- Instructions and contact information for employees to use if they find themselves in an unsafe situation or identify new hazards.

Everyone working at the facility should understand not only how to comply with safety procedures but also how to recognize, report, and correct unsafe practices. On a typical construction site, a crew member severing a gas line or cutting through an electrical cable might lead to an inconvenience. At a long-term care facility, it could be catastrophic. Empowering workers to speak up when they see unsafe practices is of the utmost importance, just as in resident care.

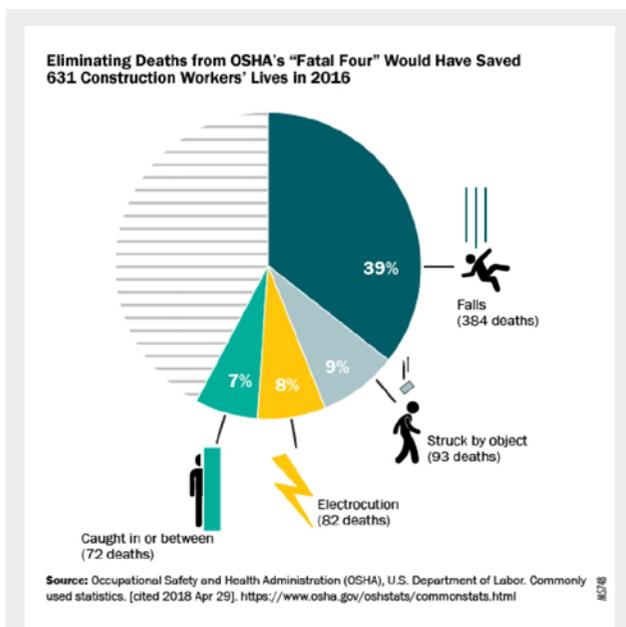
## Remember Construction Worker Safety

Resident safety is not the only consideration in construction scenarios. Construction crew safety must be taken into account whenever construction activities occur. According to OSHA, 1 of every 5 workplace deaths in 2016 occurred in construction—991 of 4693 worker fatalities (**Figure 1**).<sup>5</sup> More than half of these construction deaths (64%) were associated with 1 of 4 causes: falls, struck by object, electrocutions, and caught-in-between incidents. Eliminating deaths caused by one of these “fatal four” would save 631 workers’ lives each year.<sup>5</sup>

A construction worker should not begin to work without the proper level of PPE. A preconstruction agreement should indicate whether the contractor will provide workers with appropriate levels of PPE. If the construction activities are being done in-house, workers should be advised to be conscious of their foot, hand, head, and hearing protection.<sup>6</sup>

Before work begins, the facility must ensure the following<sup>7</sup>:

- The removal of any chemicals and radioactive materials from the work area.



**Figure 1.** Eliminating deaths from OSHA’s “Fatal Four” would have saved 631 construction workers’ lives in 2016.

- The removal of all sharps from the work area.
- The completion of surveys for asbestos, lead, and polychlorinated biphenyl (PCB)-containing materials.
- The shutdown or isolation from the rest of the HVAC system, and all ventilation compartments in the work area.
- Verification that all power sources have been de-energized. (It is also advisable to see if the construction crew would consider electronically isolating their work from the rest of the facility. Voltage fluctuations from high-energy equipment such as welding machines could cause dangerous disruptions to the facility's power supply.)
- The completion of surveys for old or abandoned waste pipes and gas lines. For example, demolishing a wall might uncover an old waste pipe—they are typically made of glass and can contain lingering acids or mercury—creating a hazardous situation.

### Prevent Worker Falls

Falls are the leading source of worker fatalities and of OSHA violations on construction job sites. Hazards related to falls can be addressed in 2 ways: through falls prevention systems and falls arrest systems.<sup>8</sup>

**Falls prevention systems.** Falls prevention uses engineering controls—such as guardrails and hole covers—or restraint systems. Guardrails can be used as a barrier to prevent workers from falling from one working surface to another. They can be used on a variety of work surfaces, including rooftops, platforms, mezzanines, balconies, scaffolds, catwalks, and ladderways. Guardrail components come in a variety of materials and configurations. It is common to use material available or produced at the worksite. Upright supports may be made from wood, formed metal, pipe, or composites. Wire rope is sometimes used for the top rails and mid-rails. Detailed definitions regarding guardrail measurements, components, and placement are available from OSHA.

Hole covers may also be used. Types of holes commonly found at construction worksites are those cut into the floor to be used as future access points or to receive equipment; cut into the roof to prepare for the installation of skylights or ventilation units; dug as excavations for pits, wells, or shafts; or cut into a roadway.

Effective hole covers should be:

- Large enough to provide appropriate overlap to prevent workers from falling through.
- Strong enough to support at least twice the anticipated weight imposed by the heaviest load.
- Left in place over the hole until access is needed.
- Inspected periodically to identify deterioration.
- Secured.
- Free from trip hazards.
- Clearly labeled.

**Falls arrest systems.** Falls arrest systems are designed to prevent or reduce injuries when workers are working from an elevated height. There are 4 elements to an effective falls arrest system, which can be remembered using the mnemonic ABCD<sup>9</sup>:

- Anchorage—a secure, structural point of attachment that can help deter falls.
- Body support—such as a full body harness. These should be inspected before use.
- Connectors—this joins the harness to the anchor point, for example, a lanyard with a maximum working slack of 2 m (6 ft, 6 in) or a self-retracting lifeline.
- Decelerator—fitting a decelerator between the anchorage and body harness can help slow a worker's descent during a fall.

Some add “E” to the ABCD system, for “effective rescue.”<sup>10</sup>

### Conclusion

The facility and its construction workers, whether employed by the facility or contracted, must agree about all safety requirements. In other settings, a contractor may prioritize maintaining a schedule or staying within budget when beginning a job. For construction in a health care facility, resident and worker safety will always come first, even if it means delaying the project or altering the budget. Preparation is key. Just as no one would attempt to build a nursing home without an architect's blueprint, no facility should attempt construction without a blueprint for safety. ■

### References

1. Weinberg K. Construction safety checklist. hepro.com website. <http://www.hepro.com/HOM-72095-5577/Construction-Safety-Checklist.html>. Published June 22, 2017. Accessed February 4, 2019.
2. Bruley M. Medical mystery: what made the night-shift nurses so sick? *Phila Inq*. March 5, 2017. <http://www.philly.com/philly/health/Medical-Mystery-What-made-the-night-shift-nurses-so-sick.html#loaded>. Accessed February 4, 2019.
3. Richardson, J. Construction morning huddle meetings good for safety and daily work plans [blog]. The Pacific Timesheet Blog. October 24, 2013. <https://blog.pacifictimesheet.com/blog/construction-daily-huddle-meetings-good-for-safety-communication-and-planning>. Accessed February 4, 2019.
4. The Austin Company. The value of safety in healthcare construction: putting safety first. [http://www.theaustin.com/sites/default/files/files/Construction%20Safety-Healthcare\(1\).pdf](http://www.theaustin.com/sites/default/files/files/Construction%20Safety-Healthcare(1).pdf). Accessed February 4, 2019.
5. Occupational Safety and Health Administration (OSHA). Commonly used statistics. osha.gov website. <https://www.osha.gov/oshstats/commonstats.html>. Accessed February 4, 2019.
6. Valentic S. Managing risk with personal protective equipment [infographic]. *EHS Today*. January 23, 2018. <http://www.ehstoday.com/construction/managing-risk-personal-protective-equipment-infographic>. Accessed February 4, 2019.
7. Garvey DJ, Sobczak SC, Streifel AJ. Medical facility renovation: safety & health considerations for construction safety professionals. *Construction Safety*. <https://aesseincluds.asp.org/professionalsafety/pastissues/046/06/014109pb.pdf>. Published June 2011. Accessed February 4, 2019.
8. Occupational Safety and Health Administration (OSHA). Fall protection in construction. Section V, chapter 4. osha.gov website. [https://www.osha.gov/dts/osta/otm/v/otm\\_v\\_4.html](https://www.osha.gov/dts/osta/otm/v/otm_v_4.html). Accessed February 4, 2019.
9. Firl C. Anchors and body support and connectors, oh my! *EHS Today*. March 1, 2010. <http://www.ehstoday.com/ppe/news/anchors-body-support-connectors-1112>. Accessed February 4, 2019.
10. Capital Safety. The ABCD and E of fall protection. ferret.com website. <http://www.ferret.com.au/c/capital-safety/the-abcd-and-e-of-fall-protection-n709878>. Published August 18, 2004. Accessed February 4, 2019.