CEDARS-SINAI MEDICAL CENTER, CA  
HEALTHCARE SECTOR CASE STUDY

ShakeAlert® Earthquake Early Warning in Hospitals

Cedars-Sinai uses the USGS-managed ShakeAlert® Earthquake Early Warning (EEW) System to save lives and reduce injuries by automatically issuing an alert over its public address system and two-way radios when shaking is expected.

Located in Los Angeles, CA, the Cedars-Sinai Medical Center is a Level-1 trauma and academic medical facility, where up to 25,000 patients, staff, and visitors may be at any given time. Cedars-Sinai worked with a ShakeAlert Licensed Operator (LtO) to automatically alert staff, patients, and visitors to take an immediate protective action, potentially before earthquake shaking arrives. Alerts are delivered through both a public address (PA) system in main areas and hallways and two-way radios that reach mobile staff.

What is the ShakeAlert System?

The US Geological Survey-managed ShakeAlert Earthquake Early Warning System rapidly detects significant earthquakes, estimates the amount of shaking around the quake, and issues ShakeAlert Messages. Then, ShakeAlert LtOs use the information contained in these Messages to deliver alerts that can rapidly trigger automated actions to protect people, vital systems, and infrastructure.

The Challenge and the Opportunity

Southern California is home to several faults capable of hosting devastating earthquakes. It is only a matter of time until the West Coast experiences a sizeable earthquake that results in harm to people, property, and vital healthcare systems. Earthquakes also threaten to interrupt the continuity of essential services, such as quality healthcare. Shaking from a significant earthquake is dangerous in a healthcare setting, as strong ground motion can injure patients, visitors, and staff, damage medical equipment, and disrupt services.

The potential seconds of advance warning enabled by ShakeAlert EEW allows people to prepare for shaking by taking a protective action, such as DROP-COVER-HOLD ON.
Getting Started with the ShakeAlert System

In 2013, Cedars-Sinai’s emergency management and safety teams learned how the ShakeAlert System, then in development, could increase personal safety. Cedars-Sinai’s executive leadership approved a pilot project in 2018 to use ShakeAlert EEW to issue an audio alert over the public address system in main areas and hallways, along with a simultaneous broadcast on all two-way radio channels. “It was an easy ‘yes’ decision by top management, especially since the CEO’s first day on the job happened to be the day of the 1994 Northridge earthquake,” recalled Ryan Tuchmayer, Cedars-Sinai Director of Emergency Management.

Cedars-Sinai used Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) funding to get started. Project managers found that ShakeAlert EEW integration with the existing fire alarm system required regulatory inspections and approvals by the California Office of Statewide Health Planning and Development (OSHPD, since renamed the Department of Health Care Access and Information [HCAI]).

IMPLEMENTATION DETAILS

Cedars-Sinai worked with ShakeAlert LtO Early Warning Labs* to get started on implementing ShakeAlert EEW. The project team first tested the viability of connecting alerting hardware to the hospital’s two-way mobile radio system. “Radios cover a lot of areas the fire alarm system is not ideal for, and help us reach mobile employees and those who work in noisy environments, such as plant operations workers,” Tuchmayer said.

When radio testing proved successful, the project team moved to enable alerting through the fire alarm’s voice announcement system. It took about six months to advance from initial testing to full implementation, with most of that time due to state regulatory inspections and approval. “This can happen more quickly today because the state is now familiar with how ShakeAlert EEW can work,” said Joshua Bashioum, CEO of Early Warning Labs. Although testing mostly took place behind the scenes, OSHPD required Cedars-Sinai to run a simulated activation of the fire alarm speakers before implementation was complete. Cedars-Sinai employees are onboarded and trained annually on how to respond to ShakeAlert-powered alerts. Training documents indicate, “Cedars-Sinai has installed an Earthquake Early Warning System. When you hear the warning, protect yourself immediately. The alert will say: Earthquake! Earthquake! Expect shaking. Drop, Cover, Hold On. Protect yourself now!” Employees are trained on how to protect themselves and how to protect patients under various circumstances, whether they are in bed, undergoing a procedure, or being transported within the hospital. “We advocate that staff download ShakeAlert-powered alerting apps on their personal devices. We also run drills during Great ShakeOut events each fall,” Tuchmayer said.

Going forward, Cedars-Sinai will expand its radio alerting coverage via a new emergency radio system. Education on ShakeAlert EEW and earthquake protective actions on internal TV channels in patient rooms is also under consideration by Cedars-Sinai.

Rising to the Challenge

“One factor that weighed heavily on Cedars-Sinai’s decision to integrate ShakeAlert was our experience with the 1994 [M6.7] Northridge earthquake and the damage that resulted from it. We’ve done a lot of mitigation and preparedness, but ShakeAlert EEW offers us a chance to get ahead to provide the warning – even if it’s just a few seconds.”

Ryan Tuchmayer, MPH
Director of Emergency Management
Cedars-Sinai

Lessons Learned

When ShakeAlert interfaces with fire alarm systems, it is important to involve construction and permitting teams from the outset. Future implementation at Cedars-Sinai’s new facilities is expected to be easier and faster (taking as little as a week), since alerts will be sent through a stand-alone PA system that won’t require significant government oversight.
Cost-Benefit Considerations

COSTS

Implementing ShakeAlert EEW at Cedars-Sinai cost $160,000 in total. Costs were covered by a $120,000 FEMA HMGP award, matched by a $40,000 investment from Cedars-Sinai. The HMGP stipulates a five-year window for maintenance from 2019-2023; the grant covers the first three years of the project and Cedars-Sinai covered the final two. Any ongoing maintenance expenses will be absorbed into Cedars-Sinai’s operating budget.

BENEFITS

Saves lives and prevents injuries, and speeds a return to normal status

By enabling the automated alerting of people across its main campus, ShakeAlert EEW provides Cedars-Sinai with a reasonable expectation of preventing injuries and saving lives; this allows staff to return to their normal duties faster. Staff who act on a ShakeAlert-powered alert may be able to secure equipment before shaking starts or power is interrupted, thus preventing or minimizing damage to equipment and leading to faster return to normal status.

Cedars-Sinai recognizes the value of ShakeAlert EEW ... because seconds matter.

Next Steps

✓ To learn more about how to boost safety in the healthcare sector, see the Healthcare Sector ShakeAlert Messaging Toolkit.
✓ To learn more about ShakeAlert Technical Partnerships, see the FAQ: Understanding ShakeAlert Partnerships and the Seismic Network, and the FAQ: How to Become a Technical Partner.
✓ See the current list of licensed ShakeAlert LtOs here.
✓ Contact a ShakeAlert Technical Engagement Regional Coordinator (below).

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