ALERTING AND COMMUNICATION

Introduction

Alerting appropriate personnel is a critical first step to a hospital's successful response to any emergency. Ongoing communication maintains situational awareness and enables incident management through recovery. A variety of communication mechanisms are available, and multimodal communication may be needed to reach different audiences. This chapter addresses the *systems* used for internal communications and alerting as well as the design of initial notifications. Ongoing information management and public relations are addressed in the Information Management chapter.

When an incident is initially recognized, alerts should be sent to the:

- Right number and type of people for the specific incident at the
- Right time, with the
- Right amount of information, via the
- Right method

Planning for the wide range of activations that may be necessary can be challenging. Carefully considering these factors, however, can ensure the alerts are scaled and targeted, thus reducing the number of staff who perceive they should have been notified of an alert or, conversely, were unnecessarily notified. This can be a challenging balance for emergency managers to strike, as there is a risk of over-response and under-response if the alert groups are not thoughtfully designed. Additionally, creating too many groups or tiers of alerting risks confusion and error in level or type of alert for the situation. Often, initial incident information is incomplete or incorrect, making it difficult to match the response to the demand.

Related Resources
Additional information is available in ASPR TRACIE's Communication Systems and Information Sharing Topic Collections.

Definitions

Alerts are categories of emergencies that the hospital recognizes. An alert can be triggered by certain circumstances or evolving information. In some cases, a leader must request the alert (e.g., a disaster such as flooding). In others, information from the public or line personnel is sufficient to trigger the alert (e.g., fire or act of violence in progress).

Notifications are comprised of three variables: 1) *Members* - the number and type of recipients of the information, 2) *Method* - the system used to convey the information, and 3) *Message* - the information provided. Several modes of notification may be used depending on the alert and situation.

Activation includes the actions taken by those notified of the alert based on the alert type, their role (as specified in the hospital emergency operations plan), and the expectations for them based on their education and training. Activation might include moving supplies, returning to the hospital to work, reporting to the Hospital Command Center, or other actions that are based solely on the notification and not on direction from incident command.

Based on their resources and responsibilities, hospitals have a wide range of capabilities regarding notification systems and alert complexity. The emergency manager should consider developing a matrix that outlines:

- **Who should be notified?** This determination should strike a balance between notifying too many people, which takes more time and potentially adds to the chaos of a response, and notifying too few people, which could leave the hospital dangerously understaffed for the response.
- **When should they be notified?** This determination will vary by each alert scenario and the authorities under which alerts are triggered.
- **What processes and systems are used for notification?**

Table 1 may serve as a starting point for developing such a matrix. The matrix can be used to vet systems and plans, identify potential gaps, and manage expectations about notifications in advance of an incident. It can also serve as a basis for developing job aids for those who initiate alerts.

Table 1. Alert and Notification Considerations

Alert	Notification	Considerations
Command Center	Internal: overhead, computer screens External: emergency management group/command staff paging	Activated automatically for mass casualty and at incident command/leader discretion for all other alerts.
Mass Casualty	Internal: overhead, computer screens External: emergency/surgical services and support personnel paging	Designed to call back personnel needed in the first 30-60 minutes. Additional groups may be activated based on incident specifics.
Internal Security	Internal: overhead, computer screens, on-call security	Notify with specific location and type of threat. May activate internal access control measures to confine the threat.

Alert	Notification	Considerations
External Security	Internal: overhead, computer screens External: only if incident affects the following shifts, commuting, etc.	Notify with the specific location and type of threat. Activate access controls for external doors and entrance/egress controls.
Patient Abduction	Internal: overhead, computer screens	Follow specific procedures for nursery and pediatric units.
Patient Elopement	Internal: overhead, computer screens	Follow specific procedures for psychiatry and pediatric units.
Fire	Internal: overhead, computer screens	Follow unit-specific procedures for confinement/control/sheltering.
Medical Emergency	Internal: overhead, on-call pagers	Includes cardiac arrest and less challenging situations. An on-call team may be notified of the specifics.
Systems Failure	Internal: overhead, computer screens External: only if incident affects the following shifts, commuting, etc.	Includes both utilities (leaks, electrical outages) and information technology. Note these may affect only the hospital or the wider community.
Weather	May be both internal and external, depending on the nature	Depends on the nature of the incident. For example, a tornado warning would be an immediate, internal alert, while watch conditions/blizzard warnings might be both internal and external and might not be announced overhead.

Call Taking

The hospital emergency manager should understand how emergency information flows within the hospital and engage with the supervisors and line personnel in planning and training. Most hospitals use the operator as the public safety answering point (PSAP) within the facility. Some hospitals have specific security/emergency operators who answer dedicated emergency lines and initiate alerts. Even if the hospital has a dedicated PSAP, some emergency calls will go to the hospital operator; there should be a routine process for referring those to the PSAP. In this chapter, “call-taker” refers to the individual who receives initial incident information.

The call-taker should have a clear list of the types of alerts at the facility (refer to Table 1 for examples), who is authorized to initiate them, and the actions taken based on information received. The call-taker should understand which alerts they have the authority to initiate (e.g., fire, security emergency, abduction) and notify the relevant groups based on the available information, as time can be of the essence.

Authority to initiate a mass casualty incident (MCI) alert or to stand up the Hospital Command Center usually rests with the emergency medicine department lead, the inpatient nursing supervisor, or the on-call administrator. Generally, this authority should rest with an onsite position to avoid delays. For alerts that require a leader to initiate, the call-taker should verify

and record the name of the individual making the request and the time. All actions by call-takers during emergencies should be documented and time-stamped.

Upon receipt of information, the call-taker should refer to a job aid to make the appropriate notifications. This information should be organized for call-takers in simple, concise algorithms or flowcharts with sequential actions to be taken for each alert (e.g., overhead page with X message, activate Y paging group with Z message). Ideally, call-takers will have pre-scripted messages with spaces for incident-specific information. This should apply to all alerts and forms of communication.

Historically, hospitals used colors to distinguish alert types (i.e., color codes). This has generally fallen out of favor because staff (including contract staff) may work at multiple hospitals that use different colors for the same alert category. Additionally, there is a frequent need for non-employees who do not know what the colors mean to be aware of situations (e.g., security threats) that might affect them. Most hospitals have shifted to plain language for the majority of their alerts.

Alert and Notification Variables

Notifications are worthless if the recipients do not know what actions to take. One of the worst-case scenarios is when employees call the PSAP for further information about what to do or to ask if they are needed. Training and job aids for employees (e.g., wall references, apps, quick reference cards attached to their ID badge holders) can facilitate quick and effective response. Some responses are hospital-wide and others are unit-specific; the hospital emergency manager will need to ensure the correct training is provided to the right audiences frequently enough that they remember what to do when activated.

From the Field
In several community disasters, including a mass casualty burn incident, the hospital specified different levels of disaster response, but the requestor forgot which level was which and requested the lowest rather than the highest level of activation, potentially delaying the mobilization of resources.

Depending on its size, the hospital may have levels of activation. Though this is attractive because it can better tailor the hospital response to the scope of the incident, it can also create confusion and complexity. Generally, departments should be supported in creating callback plans for staffing and overload issues that affect them in isolation or as a supplement to an MCI response (e.g., burn or pediatrics staff notified when multiple casualties need specialty care), while keeping the main notification groups relatively simple for the call-takers. Certain incidents like chemical emergencies requiring decontamination that need a scaled response based on the number of patients are better suited to levels of activation than others that should have a single response standard (e.g., fire or security incident). Plain language should accompany levels of activation (e.g., small, medium, large) as it can be difficult to remember whether Level 1 or Level 3 indicates the higher activation level).

Major alerts (e.g., fire, MCI) usually include notification of all staff on campus via overhead page or other means. The number of staff to call back from home depends on the type and size of incident. The number of staff to call back during an MCI, in large part, depends on hospital resources. For a very small hospital, notification of all employees may be appropriate, though even in this case, emergency/surgical personnel should be prioritized for notification if possible. For a large tertiary hospital, notifying all offsite personnel would be counter-productive due to the time required, the effects on subsequent shift operations, and the congestion it would create. Therefore, MCI pages should prioritize:

- Emergency department (ED) staff
- Surgical, anesthesia, operating room, and post-anesthesia care unit staff
- Radiology staff (particularly CT techs)
- Blood bank staff
- Command staff group (e.g., hospital administration, emergency management, security, facilities, nursing leaders)
- Supervisors from laboratory, critical care, and specific care areas such as pediatrics
- Spiritual support, social work, interpreters, and psychologists who staff the Family Support Center and provide support for employees and patients/family members

The Hospital Command Center can then activate additional providers/notification groups as needed based on inpatient needs and other factors (e.g., surgical subspecialties, unless their on-call personnel activates them during the course of the incident). The emergency manager should always encourage departments that need help to make their initial request through usual mechanisms rather than through the Hospital Command Center.

During off-hours incidents, providers who commute long distances to work will likely be used to support subsequent shifts. In this case, expectations for responses should be managed, and contingencies put in place, ahead of an incident. Some hospitals use geofencing, sort staff rosters by zip code, or ask providers how far they live from the hospital to populate callback lists with providers within 30 or 60 minutes of the hospital. There should always be a master group, however, with all providers in a job category (e.g., ED nurses) so that all providers can be notified if staffing is needed for subsequent shifts. The emergency manager should be cognizant of alert fatigue and adjust thresholds or hone notification groups as required if certain alerts are overutilized and thus yielding inadequate responses.

Some hospitals have specialty teams that will need to be activated. The hospital emergency manager should work with the department (usually the ED) to determine whether these notifications are handled by call-takers or by department personnel. There may be advantages for security and facilities personnel to have these activations go through a call-taker and follow a process that notifies additional leaders, so there are no surprises. Decontamination teams and special pathogen response teams are examples of these.

Public safety notification may be a key component of specific alerts (e.g., fire, on-campus assault). This step should be included in the script for the call-taker and often will immediately

follow the overhead notification. While the community 911 operator may ask the call-taker to remain on the line, this is not advisable except in certain dynamic security situations. Instead, the call-taker should provide a direct callback number and the necessary information, then end the call so they can access the paging system and enter the appropriate messages for the recipients.

In some cases, leaders may request that updated information be shared (e.g., that no additional personnel are needed). The leaders may specify the means of transmission but, if not, the call-taker should use the same notification systems for updates as they used for the initial alert. Follow-up messages are unscripted and thus will need to be provided to the call-takers by incident command. This type of message is generally sent when a specific action or hazard warrants renotification.

Many alerts require an “all clear” notification. Though most alerts can be initiated based on information from line employees, an “all clear” must come from the incident commander (or the leader of the response to the alert [e.g., the security supervisor if an incident commander is not designated]). The "all clear" should be announced using the same methods as the initial alert. In many cases, the incident may be over in the ED but likely continues for other areas of the hospital, which is why the incident commander typically makes this determination even if the ED initiated the alert.

Systems

There are a variety of systems available for alerting. Each system has a role in communicating emergency information but also has advantages and disadvantages. Public-facing systems in particular may need to include communication in multiple languages, icons, or in other ways to support communication to a broad audience.

Regardless of the system used, there is a chance it may not work during an incident. The hospital emergency manager should identify backup mechanisms for notification when the primary system is down. In some cases, this may be labor-intensive (e.g., manual phone calls). Use of call trees or other ways to distribute calling (and having prioritized groups/lists for calls) can make a significant difference. Overreliance on paging systems can lead to under planning, which can be disastrous when it suddenly becomes apparent that very few individuals have access to staff phone numbers.

A failure analysis and matrix can outline the backup plans (ideally, more than one plan and not reliant on the same electrical/internet backbone) for each method of communication. Contingency plans and resources should be readily accessible by call-takers, charge nurses, and other leaders and should be tested through drills with regularity. Use of runners is often the last resort but involves significant and sustained personnel commitment.

Commonly used notification systems are noted in Table 2.

Table 2. Incident Communications Technology

System	Use
Overhead paging	Present in almost all hospitals, overhead paging is the most direct and rapid method of notification, though outpatient buildings may have this capability only through the fire alarm system or not at all.
Telephone	Direct calling can be helpful in limited notifications; software can enable mass notification to many recipients via text or voice messaging.
On-screen banners	Software is available that can "grab" computer screens to display urgent messages across the hospital campus.
Message boards	Electronic message boards may serve as a channel for less urgent messaging, but they are usually complementary to other methods.
Paging systems	Often based on cell phone applications rather than physical pagers, these systems are mainstays for alerting and notification.
Portable radios	A variety of radio technologies are available, from inexpensive family service radios (best used within a small area of a facility due to range) to those integrated with public safety systems that operate on complex repeater systems (offering integrated, secure, reliable communication but at high cost and with regulatory considerations). The hospital should identify its needs and options, and balance those with maintenance and financial considerations to determine how portable radios may contribute during a response.
Emergency cell phones	Some carriers offer cell phones that can be activated during an emergency (and for which fees are only charged when active). Depending on cellular coverage, this may be a viable option. Phones may be issued based on need, role, or a combination of both to supplement usual communication methods and serve as backup during phone downtime.
App-based	Phone and computer-based applications can offer significant ability for a team to coordinate information in real time.
Cells on wheels (COWs)	COWs can be requested through the emergency management agency or other response partners to augment or provide cellular coverage in a particular area. This can be important when usual towers fail or a cable internet failure requires leveraging cellular bandwidth. COW requests should be part of tested procedures; they are unlikely to be available within 12 hours and may not be available for more than 48.
Satellite based	Many cellular phones have satellite capability that can serve as a backup communication channel if a widespread phone system failure occurs. Satellite internet can serve as a backup for a health care facility. Many plans allow the purchase of hardware and incur only usage costs. However, satellite phones are not effective indoors. Locating receivers/transmitters on the roof to support internet and phone systems requires installation and should be tested prior to an incident. Locally increased use during an internet outage, weather, and other interference may significantly degrade performance compared to test experience.
Amateur radio	Some employees may already be licensed users and can provide operating support if the hospital has a radio. Jurisdictional emergency management usually has liaisons with local amateur radio groups that can also provide

System	Use
	support during emergencies. Hospitals may wish to invest in basic equipment and ensure that antenna cabling is used as a redundant technology. Be sure to factor in response and set up time, even if there are on-campus operators.
Auto-answer/ diversion of calls	Disasters often overwhelm the main hospital phone lines with calls from patient loved ones, the media, staff, and patients seeking information about the status of upcoming appointments. An auto-answer with a general message, followed by options to divert callers to a family support line, public relations, scheduling, etc., can help mitigate some of the call volume.
Face-to-face	Major incidents involve many crucial conversations that should be held face-to-face in a small group setting if possible. The Hospital Command Center is a key nexus for communications and information sharing. Additionally, certain communications (e.g., updates on an injured staff member or new information about threatened labor actions) are best handled face-to-face to demonstrate dedication and sensitivity and to provide opportunities for sharing and feedback from other leaders and employees.

For **urgent** notifications, the following methods are often used, sometimes in combination as noted in Table 1:

- Overhead paging.
- Telephone, including mass calling platforms.
- Paging systems – The hospital emergency manager should understand and leverage system capabilities such as:
    - How easily departments can create and use groups. Ideally, department leads and the emergency manager should be able to add and delete staff, but line employees should not be able to change members or send notifications for the major groups. Permissions that are too broad have caused serious issues, including inaccurate groups and inadvertent notifications.
    - If paging groups can be nested within an alert or a larger group.
    - Whether an individual can view and message a group they are not part of (e.g., to notify a special pathogen team without going through a call-taker).
    - Whether the system can reach employees by a variety of means (e.g., text, call, app-based, landline).
    - Whether two-way capability exists (e.g., "if you are responding, press 1").
    - Whether there are different types of notifications (e.g., if an emergency message can bypass the user's settings for privacy/do not disturb).
    - How the groups and their contact information are accessed when the application is down.
- App-based – Many communication applications can be used to support incident communications. These may be simple text groups, rely on specialized technology that enables "push-to-talk" communication within specific groups, or even support incident coordination (e.g., collaboration platforms that mix features like video, chat rooms, and documents).
- On-screen banners – Computer screen banners can be particularly helpful for providing staff with details that cannot be communicated via overhead paging (e.g., additional

context or secure information) or in areas where overhead paging is inconsistent or absent.
- Runners – May be used when technology fails to deliver written or verbal messages.

Less urgent messaging may use any of these methods, depending on the breadth of the audience. Depending on the subject matter, messages may be shared via the following methods:

- Newsletter.
- Message boards (electronic or paper).
- Email.
- Voicemail.
- In-person communications, including shift change, huddle, and leadership interactions with staff.

In addition to specific notification groups, there may be times when messages need to reach *all* employees. This may occur when threatening weather or security conditions exist. In some instances, there may be a warning period or the communication is not time-sensitive, in which case emails to all employees may suffice. In other instances, an evolving threat may need to be communicated so that employees arriving at work do not put themselves in jeopardy. An all-employee notification may be necessary in this case. It is critical to be aware of the system's capacity and capabilities, including the maximum number of employees who can be notified at once, before an incident occurs. The emergency manager should explore with hospital leaders under what circumstances such notification might be needed and how best to accomplish it, given the available systems, to ensure information can be conveyed privately to a large number of employees. The emergency manager should be aware that these types of notifications can take hours to complete, depending on the software, hardware, bandwidth, and number of employees, and not assume that notifications will be as rapid as might be desired.

From the Field
Recently, a hospital activated its mass casualty plan, but the pages did not send due to a recent change to the software that capped the number of persons in a paging group. Fortunately, adequate response to the overhead page addressed the resource needs and the IT issue was recognized rapidly and mitigated the following day.

These all-staff communications tend *not* to be scripted notifications from the call-taker but are usually developed and approved by the incident commander. Additional information about unscripted communications may be found in the Information Management chapter.

Notification groups age rapidly due to staff turnover, new phone numbers, and many other factors. This reality must be mitigated by regular tests, reminders to departments to vet their lists, and persistent follow-up to ensure updates are made. Even though many listings are maintained by the individual or departments, the hospital emergency manager is generally responsible for ensuring that emergency notification lists are accurate.

The hospital emergency manager should also ensure there are quality improvement processes in place for the call-takers (through their managers) that apply to common alerts (e.g., medical emergency) and integrate with the after-action review process following an incident. This helps ensure that call-taker issues are addressed, technology performance reviewed, and gaps and opportunities are addressed through both the quality improvement process and a corrective action plan.

Conclusion

All successful responses depend on early and appropriate alerting and notifications, followed by incident communications necessary to maintain situational awareness. The hospital emergency manager should be responsible for ensuring that the alert categories are well understood and that the notifications are tailored to each category. Call-takers bear significant responsibility in these situations and must have clear, concise job aids, and training and drills on the systems they are expected to use and how to handle systems failure. All employees should understand how they will be notified of an alert and have resources to understand what to do when they are notified (i.e., their responsibilities for each alert type). Notification systems should be tested regularly to ensure they function correctly, including during drills and exercises to assess system performance and staff training to respond appropriately to alerts. Deliberate development of alert categories, notification groups, and notification policies can help manage expectations and guide training, so the emergency manager can have confidence that, when an alert is triggered, the notification processes and policies will provide timely and effective activation.

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