

# Fire Engineering®

## Commentary: It's About Time

Feb 2, 2010

*By Kriss Garcia*

The time: 1500 hours. A patient starts to experience a heavy feeling in his chest along with numbness in his left arm. Several minutes pass while he assesses his situation. The patient starts to sweat profusely and realizes that he should call for help. At 1530 hours, his spouse calls 911. A dispatcher asks the spouse a series of questions to help send the appropriate level of care. While his spouse is completing the interrogation, the patient falls to the ground and stops breathing. The time now is 1532 hours, and the local fire department, which provides EMS, is notified. Once the call is received, the crew quickly makes its way to the apparatus and begins responding. The time is now 1533 hours. The call is in the crew's first response district, and the members arrive within four minutes. The time is now 1537 hours, and the patient has been in arrest for seven or eight minutes. Even though adequate station distribution and response times were in place, the time frame to process a call from notification to hands on doubles the actual response time beyond the recommended four minutes deemed necessary for a reasonable chance of resuscitation by the American Heart Association.

In a neighboring community, the same scenario is played out, except that the fire crew is notified almost two minutes earlier. The dispatch center in the second community consistently dispatches the closest resource in less than 10 seconds. The second community's dispatch center obtains an address, and EMS is dispatched. Given this scenario, the crew arrives to find a much more viable patient in about five or six minutes.

How, then, can two calls involving well-staffed professional service providers have such dramatically different results? The first department's dispatch center focuses on sending the appropriate resources. The second community focuses on sending the closest resource quickly.

The American Heart Association states that for every minute you delay defibrillation in a cardiac arrest, you decrease the patient's survivability by 10 percent. In the second department's scenario, where rescuers arrived two minutes sooner, this translated into a potential 20-percent increase in the chance the patient would survive.

According to one study completed by the author, approximately 40 percent of the time the approved method of processing a call to determine the appropriate level of care to dispatch results in an upgrading of the initial basic life support (BLS) response to an advanced life support (ALS) response. This upgrading of a call causes substantial delay in the time it takes to get the appropriate level of care necessary on-scene. According to this same source, 10 percent of the time, an ALS call is downgraded to a BLS response. Given these facts, even the best centers, which strive to send the appropriate level of care rather than the closest resource quickly, process calls with what may be the inappropriate level of response 50 percent of the time.

Given these facts, we have to ask ourselves (and our external customers) a few questions. Do EMS providers and the citizens want the time we take to process a call to determine what level of response to send? We also have to seek out verifiable patient survival rates for each system. How often do we arrive at a scene and the information we obtain from dispatch prior to providing care makes a difference in patient outcome? One obvious area of exception for this concerns scene safety for responders. In dispatch centers that dispatch in less than 10 seconds, questioning following dispatch seeks to determine facts about scene safety, and this information is then transferred to responding crews.

One argument about systems that process calls to send the appropriate level of care is that sending fewer units will save firefighters' lives because responding to and returning from calls is the second leading cause of firefighter fatalities. Responding to and returning from incidents are a large percentage of our injuries and fatalities, but it is not solely the fact that we are responding that these situations occur. These injuries and accidents generally occur because members are operating outside approved guidelines and policies. Most of these injuries and fatalities could be prevented if good training and education are in place and there is strict adherence to policies governing response.

It is not that any dispatch model is bad; most are very good. I believe the largest limiting factor is the layperson making the call. Some dispatch systems assume a base level of knowledge and reasonableness from any person making the call. Unfortunately, stress and other factors often impact callers' ability to appropriately interact, and the reliability of processing the call diminishes greatly.

Rapid response also reaps benefits not only from the medical point of view but also on the fire suppression side. When we consider the fire part of this issue, we must look at the various agencies dispatch protocols. The National Fire

Protection Association's (NFPA) Standard 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public*, and NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, reaffirm the need to arrive at an incident as soon as possible. These standards specifically address the organization and deployment of fire suppression operations, emergency medical operations, and special operations. In these standards, the time and staffing elements addressed in providing optimum fire suppression of four and minutes directly coincide with the EMS operation recommendations of four-minute response times.

As recently as 30 years ago, the time it took a fire to advance to flashover from when a smoke detector activated has decreased from 14 minutes to less than five minutes. If we delay our response the one to two minutes it takes to thoroughly process a call, we may be arriving at a much more established multiroom fire that, through the process of flashover, has involved adjacent areas. This increased fire involvement also progressively decreases the survivable areas within the structure. With immediate dispatch of resources, the fire we would have arrived at would have been much smaller, and any victim would have a much greater opportunity to survive. The National Institute of Standards and Technology (NIST) states, "A victim will most likely succumb to the fire related injuries if that victim is within the room of origin after flashover." Any victim beyond that room of origin can survive the fire if we can intervene in the event early enough.

Another major factor that impacts firefighter safety is lightweight building construction. FDNY Deputy Chief (Ret.) Vincent Dunn states, "Lightweight wood construction is the currency of modern building" and "If you put firefighters on these types of roof assemblies you should expect that they will fall through." Today's fire loads and lightweight construction make any delay in dispatch a major element in firefighter safety. Many structural elements involved in fire will not hold the dead and live loads placed on them for more than a few minutes, so delay in dispatch could be disastrous for our firefighters.

Today's fires are much more aggressive than ever before, and the buildings are lighter and more vulnerable to the destruction wrought by fire than ever before. Sending firefighters to a structure that is safer with a smaller fire should reinforce the need for a very rapid dispatch. Imagine a crew making its way above a basement fire that has a lightweight floor system that will withstand direct fire impingement until collapse for three to five minutes. In a system aimed at quick response, this would absolutely make a difference in firefighter safety.

As we evaluate our performance as an emergency service provider and set our alarm office priorities, we must look at what the members of the community we serve desire as well as what our own fire professionals value. Service providers,

not the vendors, should set our priorities. It is up to us to determine how best to provide service and then find products that will meet our needs. Do our external customers want a call processed correctly, or do they want their firefighters to arrive two minutes sooner? Do our own fire and EMS professionals want the call processed correctly, or do they understand that to have a chance of saving civilians and to limit the chances of responders being injured they need to arrive as soon as possible? I imagine that the answer in both cases is overwhelmingly yes. Faster is better.

As we look at dispatch systems that we use to alert our crews, we must look critically at what the systems' priorities are. Many of these systems boast certification. Some actually certify themselves. What does this certification mean? Does this certification mean that crews respond quickly, or does it mean that calls are processed correctly? In my opinion, you can't have it both ways. You are either taking one to two minutes to send the correct resource with as much information as possible, or you are taking less than 10 seconds to send the closest competent intervention. Neither system is right or wrong. You should simply select the one that best fits your method of delivery.

Given our EMS role, the sooner we can intervene with basic and advanced life support, the better the patient's outcome will be. Given our fire suppression roles, the sooner we can get to a fire, the smaller we can keep it and the more likely it will be that any potential victim in areas to the fire room will survive. From a firefighter safety standpoint, the sooner we can get to a structure fire, the stronger the structure we are operating in will be.

Seconds do matter. They matter to those we are charged to serve and to those we are serving with. As our delivery methods evolve into being the most effective services we can provide, we should be driven by the simple question: Why? This simple question, when asked realistically, often starts us on an unintended journey of seeking answers that may lead to change. As Winston Churchill said, "To improve is to change. To perfect is to change often."

**Kriss Garcia** served in the fire service for 25 years and recently retired as battalion chief with the Salt Lake City (UT) Fire Department and chief of the Tooele City Volunteer Fire Department. He has a bachelor's degree in public administration, is a licensed engineering contractor and paramedic, and is an NFA instructor. He serves on the NFPA 1021 committee and is a voting member of the Air Movement Control Association.