

# INTERNATIONAL FIRE SERVICE JOURNAL OF LEADERSHIP AND MANAGEMENT



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The *International Fire Service Journal of Leadership and Management (IFSJLM)* is composed of peer-reviewed articles focusing exclusively on fire leadership and management topics. **To our knowledge, it is the only academic journal with this focus in the world.** *IFSJLM* is published by Fire Protection Publications (FPP) at Oklahoma State University (OSU). FPP is part of the College of Engineering, Architecture, and Technology at OSU and is the leading publisher in the world of fire-related education and training materials.

*IFSJLM* would not be possible without the financial support of the Dean of the College of Engineering, Architecture, and Technology and FPP. Their support represents a commitment to the continued professionalization of the American fire service.

As a further indication of the support of FPP to the international fire community, all issues of the *IFSJLM*, except the two most recent years, are available for reading **free of cost** at the Journal's website. Please go to <http://www.ifsjlm.org/PastEditions.htm> to read and/or download previous issues of the Journal.





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*Previous Recipients of the Dr. John Granito Award for  
Excellence in Fire Leadership and Management Research*

Research Symposium 2008 (RS08)

**Dr. John Granito**

Professor Emeritus and Retired Vice President for Public  
Service and External Affairs  
State University of New York Binghamton and Public Safety  
Management Consultant

Research Symposium 2012 (RS12)

**Daniel Madrzykowski**

Fire Protection Engineer  
National Institute of Standards and Technology (NIST)

Research Symposium 2009 (RS09)

**Dr. Denis Onieal**

Deputy U.S. Fire Administrator

Research Symposium 2013 (RS13)

**Dr. Anne Eyre**

Independent Consultant, Trauma Training,  
Coventry, United Kingdom (UK)

Research Symposium 2010 (RS10)

**Dr. Lori Moore-Merrell**

Assistant to the General President  
International Association of Fire Fighters (IAFF)

Research Symposium 2014 (RS14)

**Chief Dennis Compton**

Chairman of the Board of Directors of the  
National Fallen Firefighters Foundation

Research Symposium 2011 (RS11)

**Dr. Edward T. Dickinson, MD**

Professor of Emergency Medicine  
Perelman School of Medicine, University of Pennsylvania

Research Symposium 2015 (RS15)

**Dr. Denise Smith**

First Responder Health and Safety Laboratory, Department  
of Health and Exercise Sciences, Skidmore College and  
Research Scientist University of Illinois Fire Service Institute,  
Champaign, Illinois

## *Dr. John Granito Award for Excellence in Fire Leadership and Management Research*

### *The Dr. Granito Award*

Fire Protection Publications (FPP) and the *International Fire Service Journal of Leadership and Management (IFSJLM)* headquartered on the campus of Oklahoma State University (OSU) are proud to announce the creation of the **Dr. John Granito Award for Excellence in Fire Leadership and Management Research (the Dr. Granito Award)**. The award will be presented at the *IFSJLM* Research Symposium that supports the Journal held annually in July at the IFSTA Validation Conference. The award honors Dr. John Granito. John is one of the premier fire and public safety consultants in the United States. Just a few of his many Fire, Rescue, and Emergency Services research projects include: Oklahoma State University-Fire Protection Publications Line of Duty Death Reduction project (3 years); Centaur National Study (3 years); Research Triangle Institute/National Fire Protection Association/International City/County Management Association project (4 years); Fire Department Analysis Project (FireDAP) of the Urban Fire Forum (13 years); *Combination Department Leadership* project, University of Maryland, Maryland Fire & Rescue Institute (4 years); Worcester Polytechnic/International Association of Fire Fighters/International Association of Fire Chiefs/National Institute for Occupational Safety and Health *Fire Ground Performance Study* (current). He has participated in more than 400 fire department studies. John also has strong ties to academia. He served in a number of academic positions for almost 30 years, including 16 years at the State University of New York at Binghamton. He is Professor Emeritus and Retired Vice President for Public Service and External Affairs at SUNY Binghamton, which is consistently ranked in the top public universities by *U.S. News and World Report*. John has published numerous articles, chapters, and technical papers, served as co-editor of the 2002 book published by the International City/County Management Association entitled, *Managing Fire and Rescue Service*, and is a Section Editor of the NFPA® 2008 *Fire Protection Handbook*. Dr. Granito was the first recipient of the award that honors him and his service to the fire service and to academia. Each year the recipient of the Dr. Granito Award will present the Keynote Address at the annual *IFSJLM* Research Symposium.

### *Nomination Form*

Fire Protection Publications (FPP) and the *International Fire Service Journal of Leadership and Management (IFSJLM)* headquartered on the campus of Oklahoma State University (OSU) are accepting nominations for the **Dr. John Granito Award for Excellence in Fire Leadership and Management Research (the Dr. Granito Award)**. The award is presented at the Research Symposium that supports the *International Fire Service Journal of Leadership and Management (IFSJLM)* held annually in July at the IFSTA Validation Conference.

**The nominee should have made a significant contribution to the advancement of fire leadership and management through his/her scholarly/academic writing.** The Dr. Granito Award is not necessarily a life-time achievement award, although such individuals certainly should be in a prominent position to be nominated. The nominee can be a person who,

although early in their career as a practitioner/scholar or academic, has made a seminal contribution to the fire leadership and management literature.

To nominate an individual for the Dr. Granito Award, please submit by 15 January of the symposium year: (1) this form (or a copy of it), (2) no more than a one-page single-spaced letter explaining why you believe the person is deserving of the award, and (3) a copy of the nominee's resume or curriculum vitae. Please send required materials in hard copy to: Dr. Granito Award, C/O Dr. Robert E. England, Founding Editor, *International Fire Service Journal of Leadership and Management*, P. O. Box 720846, Norman, Oklahoma 73070. Or, if you prefer, scan and complete the nomination form and send all materials electronically to: bob.england@okstate.edu.

I nominate \_\_\_\_\_ for the **Dr. John Granito Award for Excellence in Fire Leadership and Management Research**. To support the nomination, I have included a letter of recommendation and a resume or curriculum vitae (CV) of the nominee. (A nomination is not accepted without the supporting letter and resume/CV.)

Nominator Name: \_\_\_\_\_

Address: \_\_\_\_\_

Zip/Postcode: \_\_\_\_\_

Contact Information:

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_

## *Message from Dr. Robert England*

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Founding Editor, *International Fire Service Journal of Leadership and Management (IFSJLM)*,  
Fire Protection Publications, Oklahoma State  
University

Welcome to Volume 9 of *IFSJLM*. Typically, readers should expect to see the annual edition released in

September or October. When the issue goes to press, however, is largely dependent on when external peer reviewers accept four or more articles for publication. Regardless of the number of articles, the volume will be available no later than the end of the calendar year.



Seventh Annual Dr. John Granito Award for Excellence in Fire Leadership and Management Keynote Address presented at Research Symposium 2014 (RS14) by **Chief Dennis Compton**, Chairman of the National Fallen Firefighters Foundation Board of Directors

## *Do Current Fire-Service Issues Offer Political and Operational Leadership Challenges?*

### *Abstract*

*The purpose of this paper is to share the results of a survey taken of metropolitan fire chiefs in 2013 and to demonstrate how the solutions to the challenges/issues they raise can be both operational and political in nature. The paper also provides guidance to fire-service leaders concerning the potential of elevating their individual and collective effectiveness in the political arena.*

**Keywords:** *metropolitan fire chiefs, fire service challenges, leadership, management, politics*

### *Introduction*

In 2013, I conducted a survey involving a group of fire chiefs who currently manage metropolitan fire departments in the United States. The departments selected for the survey were literally located from east coast to west coast and from north to south. The fire chiefs were each asked to respond to just the following two questions:

1. What do you think is the most significant challenge facing your fire department through 2015?
2. What do you think is the most significant challenge facing the fire service on a national basis through 2015?

It was a rather simple and straightforward survey, but even still, I was somewhat surprised, and very happy, when I achieved a 100% rate of return.

As I should have expected, a theme emerged in the survey responses. It is interesting that each of the challenges identified by the fire chiefs has both political and operational solutions. However, if the fire chiefs take an either/or approach (political or operational) to the issues, utilizing one approach without the other, they will most probably be limited in their capabilities to address their issues effectively. Some of the challenges identified by the respondents (fire chiefs) as local in nature were identified as national challenges by other fire chiefs who responded. The following section lists the primary challenges identified *collectively* by the survey respondents, listed without regard to local or national categories. In reality, most of the issues are both locally and nationally significant to the fire service anyway. For purposes of this paper, the challenges raised by these fire chiefs are not listed in any order or priority. These challenges/issues are followed by basic leadership strategies that might increase the influence of fire-service leaders in the political arena.

### *2013–2015 Fire-Department and Fire-Service Challenges*

- ***Understanding the Patient Protection Affordable Health Care Act (PPACA) and its impact on fire-service-based emergency medical services (EMS) systems*** — This challenge includes the importance of positioning the fire service as a resource and an important player in health care reform as the PPACA is fully phased in and implemented.
- ***Enhancing the effectiveness of fire-service-based EMS service-delivery systems overall*** — Especially important is how they relate to various social-services aspects of EMS call volumes.
- ***Better educating the public and policymakers about the current and future roles of the fire service in overall public safety*** — The fire service has morphed into an all-hazards emergency-services organization; and many elected officials and members of the general public are not aware of the full menu of services provided.
- ***Addressing collectively issues related to the image of the fire service and firefighters*** — This challenge includes understanding the political climate and how it has motivated policy and legislative actions relating to pay, pensions, and other benefits. Responding to these (often politically motivated) accusations is not simply a responsibility of *labor*. The credibility of firefighters, fire departments, and even the fire service as a whole could be at stake moving forward.
- ***Meeting the overall day-to-day firefighter safety, staffing, training, and customer-service requirements of managing a fire department in***

**a rapidly changing governmental climate** — With the pressures of increased expectations placed on fire departments, coupled with what has been a declining economy since 2008, meeting day-to-day organizational requirements have become very difficult. Managing heightened (and sometimes unrealistic) expectations placed upon fire chiefs and fire departments, both internally and externally, have become more challenging.

- **Recognizing that the longevity of metropolitan fire chiefs has been shortened** — With this reality, fire departments now face the challenge of transitioning to a new fire chief more frequently than in the past, while at the same time maintaining department morale and organizational focus. This situation creates political and functional challenges that can make it difficult for the organization to consistently function at a high level as well as for a fire chief trying to implement necessary changes.
- **Recognizing the challenges of dealing with local budgets, while simultaneously being threatened by reductions in funding for federal grant programs** — Reducing federal public-safety grant funding, while assuming that local governments will simply absorb the ongoing financial support of those lost resources or programs, may not be financially practical or possible.
- **Embracing the realization that the labor/management relationships within a fire department can, perhaps more than ever before, dictate the organization's ability to deliver quality service, while also adequately supporting the members who are trying to provide that service**
- **Recognizing the challenge for fire departments to create a different and better path forward as the economy continues its recovery** — This challenge will include realizing that political support to simply reinstate the fire department to where it was precession may be lacking.
- **Replacing the infrastructure needs of fire departments** — Since the economic downturn began, many fire departments have not been able to replace worn apparatus, equipment, facilities, communications systems, etc. In order to save money, decisions were made to retain these resources long after they should have been replaced. This payment is coming due; and creating an acceptable plan to recover from the past, and then go forward, could be challenging to fund and implement.
- **Communicating and selling the need for an adequate fire-suppression force when data indicate that the frequency of its use is declining** — Fire deaths in many large cities have declined considerably over the years and might

continue to do so. A significant challenge for fire departments is that no matter what the frequency of fire-related emergencies, an adequate fire-suppression response is critical to the safety of the public and firefighters. Addressing this issue might be especially difficult for fire departments that have not embraced and integrated EMS, hazardous materials responses, technical rescue, fire prevention, and all-risk public education as regular duties of their firefighters.

## *Effective Leadership Can Equate to Political Influence*

The fire service must place a high priority on institutionalizing its political influence at all levels of government — local, state/regional, and national. Most, if not all, of the resources a fire department receives to function will come as a result of the votes of elected officials serving at some level of government. Without political support, a fire department may lack the basic resources necessary to function effectively and safely. Fire-service leaders must possess the political acumen to engage in processes necessary to achieve the goals of the organization and maintain the public's safety.

The public image of the fire service is critical to the overall success of fire departments. The conduct and performance of fire-service members can be helpful or hurtful to that image. Time and again, the traditional media and social media contain information about fire departments and firefighters that is shared with the general public. That information can be a very positive thing, and most often is, but sometimes the reports cover behavior and/or performance that put the fire department in a bad light.

It is important that the fire service is viewed by the public as an active community participant in ways that are mission related, being involved in community decisions, and being supported by community leaders. There are many ways these goals can be accomplished, and most involve some level of activism by members of the fire department. The most obvious way for fire-department leaders to be viewed as community leaders is to engage in activities and organizations that attract other community leaders to their endeavors. Communications with elected officials, agency heads, and staff should be a priority for fire-department leaders. Interaction with schools, service on boards, commissions, and associations, as well as participation in cross-functional planning sessions, should be priorities for fire departments. The fire service simply should not isolate itself in a public-policy arena that encourages partnerships, coalitions, and positive relationships with others. Integrating fire-service leaders into the public-leadership arena helps over time to validate the fire service as a leader in the eyes of its partners.

Fire-service leaders should strive to serve as *trusted advisors* to elected officials and their staff members. When interacting within this environment, the trusted

advisor must always tell the truth and never be threatening. Emphasis should be placed on trying to build trusting and respectful relationships within the political arena. The professional staff of elected officials is important and influential. Staff members often conduct briefings with the elected officials and control access to them as well. It will pay great dividends to treat them accordingly.

It is important that the fire service as a whole support the Congressional Fire Services Institute (CFSI) in Washington, DC. This organization works in support of a number of fire-service issues and federal legislation each year. To be effective, they need the resources necessary to fill that role. Several national fire-service organizations have Government Affairs Directors who serve on the National Advisory Committee (NAC) of the CFSI. There are several ways that members of the fire service can provide the support necessary to ensure that the CFSI continues to function at a high level. Visiting [www.cfsi.org](http://www.cfsi.org) will provide information on how to take advantage of those opportunities and a lot more.

Fire-service issues should never be framed as partisan issues — they are American issues. The fire service must be successful politically no matter what particular party is in power in the executive or legislative branches of government. Lacking respect for this reality can cause support for the fire service to swing up and down, depending on the outcome of elections each time they are conducted. The leadership of local fire departments, state-level organizations, and national fire-service associations make a significant difference in how the political process impacts the fire service at all levels of government. These leaders must always conduct themselves in a way that is in the best interest of the fire service.

## *Conclusion*

The survey responses from the selected fire chiefs could serve as guidance to major fire-service membership organizations and associations when deciding what types of support and information to provide to their members. These organizations and associations should consider and utilize what these fire chiefs identified as their most important challenges when forming the basis for the guidance they receive from the organizations to which they belong and often pay dues. Major fire-service conference and webinar managers

could use survey results to help formulate some of their education and training offerings in an effort to more effectively focus on the current challenges of fire chiefs and chief officers in general. Political effectiveness of fire-department leaders should also be among the critical subjects they address.

The political process drives many of the decisions that affect the fire service in significant ways. Putting emphasis on preparing fire-department leaders to effectively engage politically is important and must be considered a leadership requirement. These challenges and political strategies could actually form the foundation for a series of papers in years to come. The operational and political aspects of addressing the issues identified in this paper will play major roles in the overall success of the fire service in both the short term and long term. Even though other major fire-service issues or challenges may emerge over the next few years, the input of these metro fire chiefs in identifying the current challenges is helpful, and it should provide the fire service with a degree of leadership guidance.

## *About the Author*

**Chief Dennis Compton** is a well-known speaker and the author of several books including his most recent offering titled *Progressive Leadership Principles, Concepts, and Tools* (published by Fire Protection Publications in 2010). He has also authored the three-part series of books titled *When in Doubt, Lead*, the book *Mental Aspects of Performance for Firefighters and Fire Officers*, as well as many articles, chapters, and other publications.

Dennis served as the Fire Chief in Mesa, Arizona, for five years and as Assistant Fire Chief in Phoenix, Arizona, where he served for twenty-seven years. Chief Compton is the Past Chairman of the Executive Board of the International Fire Service Training Association (IFSTA) and Past Chairman of the Congressional Fire Services Institute's National Advisory Committee. He is currently the Chairman of the National Fallen Firefighters Foundation Board of Directors, and Co-Chairman of the Fire Service-Based EMS Advocates Coalition Steering Committee. Chief Compton can be reached at [dcompton5@cox.net](mailto:dcompton5@cox.net)



The article that follows is based on a paper presented at the *International Fire Service Journal of Leadership and Management (IFSJLM)* Research Symposium 2014 (RS14). As a previous recipient of the Dr. John Granito Award for Excellence in Fire Leadership and Management, Dr. Eyre was invited to deliver a paper at the symposium. RS14 marked the 10<sup>th</sup> Anniversary of the annual *IFSJLM* Research Symposium.

Dr. Anne Eyre, Independent Consultant, Trauma Training, Coventry, United Kingdom (UK)

## *Communication and Fire Service Organisations: New Reflections on an Old Challenge*

### *Abstract*

*This paper explores communication issues within fire and other emergency service organisations. It highlights how human factors in communication, the interaction between information, people, and technology, present both challenges and opportunities for the effectiveness of communication within and across emergency service organisations today. A United Kingdom (UK) initiative focussing on interoperability is reviewed to illustrate the links between operational communication and a shift towards greater collaborative working. With a view to fire services being learning organisations, the paper concludes by identifying a future role for communications in translating the rhetoric of learning and improving the work of fire and other emergency service organisations into reality.*

### *Communication: Information, People, and Technology*

This paper focuses on a topic of relevance not only to fire and other emergency service organisations across the United States (US) but also for human societies across the globe, namely the wish and need for people to communicate with each other. For fire services today, forms of communication, whether written, verbal, oral, or virtual, are fundamental parts of their routine activities within emergency preparedness, incident response, and post-incident operations.

Communications technology in itself will not make human beings better informed, more efficient, or smarter at what they do. This point is made by Paul Johnson (2007) in his book *The Email Survival Guide* in which he explores the nature of communication in relation to the interaction between technological innovation and human beings. In a working environment, he suggests, as well as getting to grips with technological innovation, you need also to understand the full impact of the messages or forms of information you are sending to understand how those receiving them will react and how to draw the best out of those with whom you interact. In other words, communication is about the interaction between information, people, and technology.

Although his book, published in 2007 and focusing mainly on surviving email deluges at work, is already outdated as of 2014 (his writing largely predated the rapid rise and spread of social media such as Facebook and Twitter for example), its underlying theme highlighting the relationship between people

and technology as fundamental to communication is just as relevant today as in the past, as the history and development of communications technology shows. Charting the development “from cavemen to the internet,” Johnson (2007, p. 8) shows how the effectiveness of every innovation has to a great extent depended on an effective system of communication, a way of spreading the word and passing the technology from one to another. He briefly outlines how, following the invention of language, the development of message systems progressed from smoke signals through to riders on horseback carrying messages to and from the battlefield. With the invention of the Pony Express in the 1860s, this system of communication enabled messages to be sent across the US from east to west before the telegraph was established. Later, with electricity came telegraph and transatlantic technologies; the nature and speed of information transfer was enhanced and 1876 witnessed the invention of person-to-person communications through the telephone.

Wireless communications followed with the development of radio transmissions, television, and eventually office communications, which continue to transform our workplaces. Computers, the internet, email, and increasing forms of social media and social-networking opportunities have revolutionised the nature of work and ways of working as well as our home and social lives.

With greater volumes and flow of information these days, a pertinent question for today’s fire services and

other emergency service organisations they work with is whether their communication is better or more effective. In other words, what is the relationship between the technologies they use, the nature and quality of the information available to them, and the effectiveness of their people in making the best and most appropriate use of these? To quote Johnson (2007) once again, "To make real progress you need not just inventive discovery but also an effective system of communication." (p. 8)

### *Aspects of Fire Service Communications*

The work of the fire service includes a number of areas of communication as part of their routine working, including the following:

- *Within their organisation* (using, for example, control-room technology and other information systems to communicate between and among different groups of staff, both on and off the fire-ground)
- *Across organisations* (as part of joint, collaborative working for example in areas such as community safety, medical services, broader risk management, and research activities as well as incident response)
- *With key stakeholders* (before, during, and after incident response, including for example investigators and politicians where legal, political, and cultural factors may influence who, when, and what information is shared and exchanged, as well as how and by whom)
- *With the media and the public* (where this function is often delegated to services' press offices for assisting with the development and implementation of media and communications strategies)
- *With families or particular communities* (for example, targeted social groups for the implementation of a community engagement project strategy, or families of those directly affected by a particular incident, for follow-up support, advice, or guidance).

In all of these endeavours, innovation and advancements in the nature of information and technology have revolutionised the work of fire services, particularly in recent years, bringing both challenges and opportunities. But while it is right that communications research and development focuses on physical systems, infrastructures, and platforms, equal attention also needs to be given to social, cultural, and political aspects; the human dimension is also central to effective communication. People (firefighters, managers, commanders, individuals within partner and stakeholder organisations, the public, and families) lie at the heart of fire-service communications; and their thoughts, feelings,

behaviours, needs, wants, and expectations are fundamental to information exchange.

Some years ago at a conference, I listened to some United Kingdom (UK) fire service colleagues engaged in a lively debate about the effectiveness of mobile communication networks between the emergency services. The focus for their discussion was the incident response in two major incidents, both of which had involved extensive loss of life. The events were twenty years apart and yet, despite the lessons from the first, including the recommendation that emergency services become better able to communicate with each other during life-threatening emergency situations, the same failures had become apparent in the response to the second mass-fatality incident. The heated conference exchange was focussing on the quality of technical equipment and facilities, at which point an American fire professional (an ex-commander) piped up. He commented that he had been involved in similar kinds of exchanges in the US in the aftermath of a mass-fatality incident there, until they realised that the key lesson was that it was not just about the technology, rather they realised the culture was such that the fire and police services did not actually want to talk to each other! The remark was perhaps tongue-in-cheek, but the undertone was clear.

As Johnson (2007) states, "Communications technology will not in itself make you a better informed, more efficient, a smarter business player . . . *only you can do that* [emphasis added], but technology can help you in the process." (p. 5)

The human elements in (fire service) communication include the following:

- **Understanding** — For example, the extent to which language, terminology, meaning (of words and situations), and interpretation are shared.
- **Culture** — Which includes both formal and informal working practices (such as official rules, professional standards, and policies but also the informal and unofficial ways we do things around here). There can be a difference between best practice as usual practice and when individuals deviate in the extent to which they play it by the book. In addition, culture is about ethical standards and values (and the extent to which notions such as taste, decency, privacy, and dignity are commonly understood and shared).
- **Relationships** — Between, for example, rank and roleholders within and across organisations and reflecting the extent of mutual interests and political and power interests at play. The nature of relationships and communication styles may differ across fire-service environments to indicate variable notions of authority and leadership, such as the contrast between command and control and more participative approaches on and off the fireground.

## *Social Media and Fire Services: New Opportunities Bringing Cultural Change*

New opportunities for fire services have been created by advances in technology and information that have brought changes to understanding, culture, and relationships as integral elements of intra- and inter-organisational communications. A good example of this technology is the rise of social media, which has brought greater interaction among people through the sharing and exchanging of information and ideas in virtual communities and networks.

Fire services across the world are positively embracing the opportunity to use social media to communicate with the public. In December, 2013, for example, social media network Twitter launched its emergency alert service in Australia to help police, fire, rescue, and other emergency services disseminate critical information to their followers (Jackson, 2013). This event followed the activation and use of similar alert services in emergency situations in the US, Japan, and Korea in September and in Britain a month earlier.

In the UK, the London Fire Brigade began using social media in 2010, and its Twitter feed, @London-Fire, is now used to provide real-time information about incidents taking place across the capital. The Brigade uses Facebook to provide fire-safety information as well as engaging with the public informally on the work of the Brigade. As the Deputy Commissioner Rita Dexter argued in 2012 when announcing plans to set up the world's first 999 emergency Twitter feed:

When it was first set up in 1935, people said that dialling 999 to report emergencies would never work. Today BT (British Telecom) handles over 30 million emergency calls each year. It is time to look at new ways for people to report emergencies quickly and efficiently and social media could provide the answer in the future. (London Fire Brigade, 2012, p. 1)

The Los Angeles Fire Department (LAFD) is an example of a US fire department that has recognised the value of social media for assisting the daily activities of firefighters in the city. In addition to the dissemination of information, LAFD uses Twitter to monitor and collect information. Such *listening* activities illustrate two-way communications opportunities afforded by social media. Brian Humphrey, LAFD's Public Information Officer, explains:

We're using the new media to monitor, not just send our stuff out via Twitter, but monitor what other people are sending via micro-messaging services, what other people are sending pictures of, what their queries are, what their questions are in real time. (Humphrey in Latonero & Shklovski, 2011, p. 10)

In their paper discussing the practices and challenges of new media implementation for crisis and risk organisations, Latonero and Shklovski (2011) highlight how the LAFD had moved toward broader support of social media in its daily activities. It had established more wireless hotspots and increased the number of people with Twitter accounts up the chain of command. They also document the role of Public Information Officers (PIOs) in the LAFD and highlight the value and importance of what they call the *information evangelist* within crisis and risk organisations. They suggest that such *visionaries*, located at the heart of technological change within organisations, can initiate social media implementation and help drive forward broader change in organisational culture, relationships, and communications. From their LAPD case study they conclude:

As we observe PIOs engaging with these technologies, we argue that the PIO's function at the LAFD has exceeded its previous role as primarily sending official messages to the public via traditional media. Indeed, as social media continue to proliferate, we might reformulate questions of how emergency management utilise social media to include questions about how emergency management organisations themselves are changing due to the innovations offered by the emerging communications technologies and the push from broad-scale public adoption of these technologies. (Latonero & Shklovski, 2011, p. 14)

### **From Unidirectional, Command and Control Via the Media to Two-Way, Peer-to-Peer, and Participatory Communications**

The London Fire Brigade and LAFD examples illustrate how fire services are embracing the opportunity to use social media to go beyond their traditional role of imparting information to include building relationships with their communities both before and during small- and large-scale emergencies. During the Tasmanian bushfires in January, 2013, Australian fire authorities used social media to issue a variety of useful emergency feeds and information on what to do in a bushfire. In New South Wales (NSW), the NSW Rural Fire Service operated an emergency feed on its website. This feed included a map of current incidents, which was mirrored by Google in case it went down, and a map of total fire bans and fire-danger ratings. They also sent out alerts through Twitter, Facebook, and their iOS app, Fires Near Me.

Martin Anderson, digital media manager for the Australian country fire authority, has identified the following three fundamental changes to mind-set that are critical to any effective use of social media when managing an emergency:

1. From “We hold the information the community needs and we expect them to come to us” to “We realise we need to go to the community.”
2. From “We will decide what the community needs” to “The community will tell us what they need.”
3. From “The public is a liability” to “The public is a resource.” (Anderson in Barker, 2013, p. 1)

The Australian fire authorities were able to respond as they did with the bushfires because they placed a premium on community education and preparation well before crisis events. By building stronger community relationships before emergencies, they were able to use the news media in this way during the crisis.

Barker (2013), a social media trainer and writer, cites Boston, Massachusetts (MA), as a further example of this philosophy. The Boston police department had worked hard to develop strong community relations before the bombings in 2013. Even before the bombings, he stated that its Twitter following total was 40,000, higher than most local media outlets; the department was already active on a range of social media sites; and it had a blog, Facebook page, Twitter feed, and YouTube and Pinterest accounts. “In short, they had already positioned themselves as a trusted source of information that people could turn to in times of crisis.” (Barker, 2013, p. 1)

When the bombings occurred, therefore, they were able to use the news media to manage the emergency. In this case the approach they used was

a carefully calibrated command-and-control use of social media with a selective sharing of timely factual information to counter media rumour, re-assure the public, and protect the location of investigating officers in a fast-moving and unpredictable environment. The use of Twitter came to the fore when the police department’s blog and website crashed under heavy traffic; through Twitter, it enlisted the support of a vigilant public by sharing information and photographs and expanded its reach to an estimated 49 million people within five days. (Barker, 2013, p. 1)

Researchers in communication have noted how opportunities for participation by members of the public are expanding the information arena of fire and emergency management (Sutton, Palen, & Shklovski, 2008). These scholars point out that during emergencies, members of the public no longer rely on a single source of information. In contrast to traditional approaches of the authorities, they tend to use informal, unofficial, peer-to-peer, and backchannel (unofficial, irregular, and unregulated) communications. These forms of communication include the use of social media such as social networking sites, text and instant messaging applications, blogs, wikis, and other web forums.

Social media supports “backchannel,” peer-to-peer communications and public participation, allowing for wide-scale interaction that can be collectively resourceful, self-policing, and generative of information that is otherwise hard to obtain. (Sutton et al., 2008, p. 1)

In contrast, the traditional Incident Command System of communication uses a command-and-control approach characterised by a unidirectional process of formal, official flow of info from officials to the public via the media (Tierney, Lindell, & Perry, 2001).

Sutton and colleagues (2008) note that public officials often view *backchannel* communications as having strong potential to spread misinformation and rumour, thereby compromising public safety. But, they also argue that with each new disaster, peer-to-peer communications through social media such as social networking sites, text and instant-messaging applications, blogs, wikis, and other web forums are growing as a means for supporting additional, often critical and accurate, dissemination of information within the public sphere. Consequently, Sutton et al. (2008) call into question the resort to a command-and-control approach via the media and challenge the ingrained view of unidirectional, official-to-public information dissemination more than ever before as previously *backchannel* activities become increasingly prominent. Researchers such as Sutton et al. (2008) see the need for change in emergency-response-management policy to take into account the changing Information and Communication Technology (ICT)-extended information arena of disaster and to recognise its advantages.

In view of such developments, organisations such as the National Fire Protection Association® (NFPA®) have reviewed and are responding to the successes and pitfalls of social media use before and during emergencies. An NFPA® task group comprised of committee members from NFPA® 1600, *Disaster/ Emergency Management and Business Continuity Programs*, is attempting to develop language on social media use for the standard’s 2016 edition. Jo Robertson, chair of the task group, has commented:

If social media is able to push out emergency information to critical audiences, we have to be able to use all of these tools . . . Social media use is a reality. We all have to get past the notion that this is something we can ignore. (Robertson in Durso, 2014, p. 1)

## Ethical Standards and Expectations: The Need for Departmental Social Media Policies

Technological change and innovation in the nature, method, and speed of communication continues at a pace seemingly unabated. In today’s world, more attention, it appears, is given to technical possibilities. The assumption is that *more and faster* represents



progress and is necessarily a good thing for society; less attention appears to be paid to the social and moral consequences of such rapid and prolific cultural changes.

Ethical discussion, formal guidance, and training around the generation, ownership, and sharing of images and information via social media in public and private settings have rather followed in the wake of the technical ability to create and disseminate material. Even where there is debate on standards, the meaning and value placed on concepts such as *taste*, *decency*, *privacy*, and *dignity* are not commonly agreed upon; and there is scope for even wider interpretation of these notions and their practical implications in the world of social media and networking.

For fire and other emergency-service organisations, this trend raises new questions and challenges, particularly in relation to the standards and values that they, as employers, expect of their employees. It is one thing, for example, for the public to be free to film and instantly upload images from emergency scenes, but quite another for emergency responders. They are under a duty of care to the vulnerable in attending incidents and an obligation to reflect and represent the professional standards of the department or organisation for which they work. As Dr. Denis Onieal (2014), Superintendent at the National Fire Academy has commented: “The public image of the fire service is important to the overall success of fire departments. The conduct and performance of fire service members can be helpful or hurtful to our image.” (p. 1)

Fire departments are discovering how important it is to have explicit policies that elucidate working practices and expectations in this new communications era. For example, in December, 2013, Washington District of Columbia Fire and Emergency Medical Services (DCFEMS) introduced a new policy limiting what firefighters and emergency responders can post to social media outlets such as Twitter and Facebook. The policy forbids employees from using social media to disseminate *inappropriate postings*, which include but are not limited to discriminatory remarks, harassment, retaliation, sexual innuendo, and threats of violence or similarly unlawful content. The policy also prohibits employees from posting “confidential, private or any information obtained directly or indirectly as a result of employment with the Department” (Washington District of Columbia Fire and Emergency Medical Services [DCFEMS], 2013, p. 1). Employees can reference their employment with the department in their personal activities but must include a disclaimer stating the opinions expressed are personal and do not reflect the views of the department nor the Washington District of Columbia (DC) government.

Some commentators regarded the introduction of the new policy as a move aimed at silencing critics of a department that had seen its share of troubles over the previous year. The *Washington Times* described

the new policy as “highly restrictive” (Noble, 2013, p. 1), while others asserted that the approach was “out of touch” (Darwin, 2013, p.1). Darwin cites Jeanne Meister of Forbes who suggests “organizations whose social media policies are too broad [in their limitations] often lose the chance to help guide their employees into habits of using social networks respectfully.” (Meister, 2013, p. 1)

In 2011, the same fire department had suspended its popular Twitter account in order to get a tighter handle on information disseminated about emergency operations. The account often provided minute-to-minute updates on emergency operations. A Fire Department spokesman, Lon Walls, later commented that “It’s OK for parties and that type of stuff, but I’m not big on Twitter for issues of public safety.” (Walls in Noble, 2013, p. 1)

In August, 2013, one Washington DC firefighter spoke anonymously to the local media suggesting that the department’s leadership was simply trying to keep employees from posting information that is damaging to the already-troubled department. This comment followed a firefighter taking a picture of an ambulance that caught fire while responding to an emergency call, an image that was disseminated by the firefighters union as visual proof that the department’s fleet of fire trucks and ambulances suffered from maintenance issues. An internal audit commissioned by the city and completed in November confirmed that the fleet was in “overall poor condition.” (Austermuhle, 2014, p. 1)

Martin Austermuhle (2014) comments how a social media policy adopted in Baltimore in late 2012 provoked similar arguments between department officials and the rank-and-file members, with department officials saying that social-media limits served to protect privacy and public safety and rank-and-file members complaining that they instead tamped down on firefighters First-Amendment rights. Recommending that organisations update their social media policies, Meister (2013), a workplace consultant, has commented, “While I oppose company policies that unfairly limit employees’ rights to express themselves online, employers must be smart about training employees on what they should and should not share online, especially in times of uncertain job stability.” (p. 1)

### *Improving Communication and Interoperability: The UK Initiative Joint Emergency Services Interoperability Programme (JESIP)*

As well as tackling policies, politics, and practices around internal communications and employees’ use of social media, an ongoing challenge for fire services is communication with external partner agencies and organisations involved in incident planning and response. There is a drive within the UK on improving operational communication as part of enhancing interoperability, that is, the extent to which emergency-

service organisations can work together coherently as a matter of course. The drive reflects an acknowledgement of the need for greater collaborative working between a range of disparate organisations, each with their own working practices, objectives, languages, and cultures.

Following a series of reports, recommendations, and lessons learned from a number of major incidents within the UK, specifically the 2010 shootings in Cumbria; the April, 1989, Hillsborough stadium disaster, resulting in the Hillsborough Independent Panel (2012) report; the July, 2005, London bombings, resulting in the Hallett report (2011); and the UK 2007 summer floods, resulting in the Pitt Report (2007), a tri-service group from the police, ambulance, and fire service was formed to address the recurring issues raised around better joint working across those services at incidents. As a result, the Joint Emergency Services Interoperability Programme (JESIP) was established in early 2012 by the heads of the three professional associations

working closely with key government departments. The strand of operational communications was identified early as a key strand of JESIP’s work.

In support of JESIP, a report was commissioned to identify persistent issues and lessons relating to interoperability from emergencies and major incidents since 1986 (Pollock, 2013). See **Table 1** for a summary of key findings and recommendations. The review examined thirty-two reports relevant to interoperability, which highlighted, among other things, why a focus on operational communications should be one of the main themes of JESIP.

Ineffective communication was identified as a common issue across the incidents reviewed as was the need for a common system used by all stakeholders with the capacity to deal with surges of activity associated with major incidents. Consequently, the JESIP has identified the following tasks within its communications work stream:

**Table 1: Examples of Relevant Findings and Recommendations Identified in UK Emergency and Major Incident Reports Which Reflect Themes Around Operational Communication (as identified in the Pollock Report (2013)).**

<p><b>Examples of findings in reports which reflected problems in communication:</b></p> <ul style="list-style-type: none"> <li>• Breakdown in communication and instructions</li> <li>• Overwhelmed police radio networks</li> <li>• Lack of a common radio system, which hampers communications on the ground between emergency services</li> <li>• Inadequate control room displays; poor design and layout (did not adequately communicate what was happening and hampered response)</li> <li>• Lack of two-way communication between management and staff</li> <li>• Inability to see the full picture in a way that would prompt action</li> <li>• Lack of effective sharing of knowledge of risk</li> <li>• Inadequate communications within and between the emergency services that “did not stand up”</li> <li>• Basic misunderstandings between the emergency services as to their respective roles and operations</li> </ul>
<p><b>Examples of communication elements needing to be addressed:</b></p> <ul style="list-style-type: none"> <li>• Quality and scope of communication systems and facilities</li> <li>• Formal safety reporting and monitoring systems</li> <li>• Media strategies and the provision of public information</li> <li>• Ways to enhance positive working relationships</li> <li>• Ways to create debriefing processes</li> <li>• Common rules for information exchange</li> <li>• Methods of major incident notification, e.g., a cascade contact system, or group email or other alerting system</li> <li>• Language: Terminology is confused</li> <li>• Ways to inform and warn the public</li> <li>• Information sharing and planning</li> <li>• Command protocols to ensure that Commander position is clearly defined</li> </ul>

- Review and revise national Tri-Service Airwave Network<sup>1</sup> (commonly referred to as “Airwave”) doctrine and guidance; produce a simple aide memoir.
- Progress Airwave training modules.
- Develop a regular standard test for Incident Commanders.
- Develop Tri-Service Airwave Network training for Tactical Commanders.
- Progress a Tri-service common call sign structure.
- Carry out a Tri-service Command and Control review.
- Develop a Tri-Services mobilisation Memorandum of Understanding (MOU) between national coordination centres for improved deployment communication.

### *Communication as Fundamental to Organisational Learning*

Pollock’s (2013) review (see Table 1) highlighted a number of common causes of failures identified within incident reports over the twenty-year or so period under review. These causes included poor working practices and organisational planning, inadequate training, lack of leadership, and the failure to ensure that lessons were learned and staff members were taught. It can be argued that communication within and across emergency organisations, or rather deficiencies in communication, is a fundamental element in all such causes and effects. For example, in order for lessons to be responded to and improvements in incident response implemented, lessons must be aired and shared within and across organisations; in terms of communication, this issue is as much a cultural one, a matter of people’s beliefs, values, and practices, as a technical one.

Pollock’s (2013) review highlights an important and worrying reality, namely, the common experience of organisations failing to learn lessons and acting on previous reports and recommendations.

The consistency with which the same or similar issues have been raised by each of the inquiries is a cause for concern. It suggests that lessons identified from the events are not being learned to the extent that there is sufficient change in both policy and practice to prevent their repetition. (Pollock, 2013, p. 7)

Pollock (2013) also concludes that in addressing this shortfall, attention needs to be paid just as much to human and cultural factors as to systems and processes:

The overwhelming number of recommendations calls for changes [in] the doctrine and prescriptions [that] are often structurally focused, proposing new procedures and systems. *But the challenge is to ensure that in addition to the policy and procedures changing, there is a change in organisational culture and personal practices. Such changes in attitudes, values, beliefs and behaviours are more difficult to achieve and take longer to embed* [emphasis added]. However, failure to do so will result in the gathering of the same lessons which repeat past findings rather than identifying new issues to address and continuously improve the response framework. (Pollock, 2013, p. 7)

### **Communication and Learning Organisations: Rhetoric Versus Reality**

The aspiration to be learning organisations is a stated goal of many contemporary fire and emergency departments. Case-study research on fire departments has reviewed such endeavours and the extent to which communication issues, in terms of sharing and learning from experience, have helped or hindered their achievements of this goal. For example, in an article in *Fire Rescue*, David Griffin (2013) outlined the implementation of organisational learning across the City of Charleston, South Carolina (SC), fire department following the tragic events of June 18, 2007, when nine firefighters perished in a warehouse fire. With a master’s degree in executive fire service leadership and a doctorate in organizational leadership and development, Griffin (2013) describes organizational learning at its best as involving

everyone who is involved in an organization, from the top to the bottom. Learning, knowledge, education and training cannot be hoarded by specific people in an organization. Everyone has to work together to ensure that members are collectively learning from each other and the experiences of other organizations. (p. 1)

In another study, Rich Gasaway (1999) assessed the Roseville Fire Department as a learning organisation. He concluded in this case that the fire department’s history and reputation as a learning organisation did not match up to its reality and identified organisational communication as a key area for improving this gap.

In the UK, reviews such as the one by Pollock (2013) discussed previously, have highlighted how the rhetoric of learning from past experience for the future does not always match reality. On the one hand, public and private services today talk about open, honest transparency in their relationships with the public and other stakeholders; for example, County Durham and Darlington Fire and Rescue Service (2014), National Health Service (NHS) England (2014), and Network

Rail (2014). There is greater emphasis in public and political debate on public accounting, accountability, and corporate responsibility (Institute for Government, 2012). But on the other hand, open, honest communication in the aftermath of incidents and emergency response is often stifled for fear of a *blame culture*, stigmatisation associated with *whistle-blowing*, or fears of litigation and prosecution. The high-profile example discussed in the following section involving a UK police department service illustrates this point and the role communications technology now plays in exposing the gap between rhetoric and reality. In this case not only did the police department in question take active steps to prevent their organisational accountability and learning during and after a major emergency, but twenty years later when this situation was being exposed, official, public-facing communications once again differed from *backchannel* or in-house communications between senior officers.

### The Chief Constable's Ill-Judged Email

On September 12, 2012, the Chief Constable of South Yorkshire Police issued a public apology about his force's behaviour in relation to the causes and consequences of the 1989 Hillsborough Stadium Disaster in which 96 Liverpool football fans died (British Broadcasting Corporation [BBC] News, 2012). His apology to families of the 96 Hillsborough victims and Liverpool fans in general was in response to an independent report, published some twenty-three years after the disaster, which highlighted the damning role of the police during and after the major emergency. Not only had they played a significant part in causing the disaster but, the evidence showed, had taken significant steps to cover up their responsibility in the aftermath through the substantial altering of witness statements and other actions. A Review Panel found the police actions to be an orchestrated attempt to shift blame for the disaster away from the police department and onto the victims and survivors (Hillsborough Independent Panel, 2012).

In his apology the Chief Constable said the following:

In the immediate aftermath [of the event] senior [police] officers sought to change the record of events . . . . Disgraceful lies were told which blamed the Liverpool fans for the disaster. These actions have caused untold pain and distress for over 23 years . . . . I am profoundly sorry for the way the force failed. (BBC News, 2012, p. 1)

However, a few months later, the details of internal emails he had sent shortly before that September 12 apology were exposed through a Freedom of Information request and publicised. They revealed a rather

different sentiment being discussed in-house in the days before the press statement was issued. In one email sent to his deputy and the force's head of media four days before his public apology, Chief Constable Crompton disputed the Hillsborough families' version of the truth and proposed using the force's public-facing website and Twitter account to mount their own case for the defence: "I just have the feeling the media 'machine' favours the families and not us, so we need to be a bit more innovative in our response to have a fighting chance otherwise we will be roadkill" (Press Association, 2013, p. 1).

Given the public feeling at the time, the revelation caused outrage. After investigating the matter, the police watchdog, the Independent Police Complaints Commission (IPCC), wrote to the chief constable expressing concern that his comments were "at best ill-judged and at worst offensive and upsetting" (Independent Police Complaints Commission [IPCC], 2013, p. 1).

This example illustrates how there can be a difference between *front of house*, public-facing communications and *back of house* or *backchannel* communications. But the example also highlights how, through legal developments such as Freedom of Information requests,<sup>2</sup> the UK public now has a *right of access* to both such communications. This new position may, at best, encourage greater openness, transparency, accountability, and integrity among public servants and their leaders. But at the very least, it means public bodies now have to be more wary about the nature and content of what they think, say, and do through all communication channels.

### The Future of Fire Service Communications

The ongoing drive towards technological change and development will continue to have implications for the way in which fire and other emergency services communicate within and across their organisations, as well as with other key stakeholders such as the public and the media. At the same time, equal consideration should be given to the social, cultural, legal, and political context in which those same organisations function and serve and the implications for their communication strategies, policies, and practices.

In the UK, there are new calls for a *duty of candour* among health and other public services. The call came following an extensive inquiry into failings at a National Health Service Foundation Trust, chaired by Queen's Counsel (QC) Robert Francis (2013). The Francis Inquiry and Report highlighted the appalling suffering of many patients within a culture of secrecy and defensiveness. A whole system failure meant checks and balances were either not in place or not working to ensure that patients were treated with dignity and suffered no harm. Within the report's

recommendations, the *duty of candour* is defined as “ensuring that patients harmed by the provision of a healthcare service are informed of the fact and that an appropriate remedy is offered, whether or not a complaint has been made or a question asked about it” (Francis, 2013, p. 75).

Although generated within a health context, it is argued here that fire and other emergency services should embrace this general impetus towards candour and the broader cultural expectation of honesty, transparency, and accountability, not only in what they do but also in the way they communicate about what they do before, during, and after engagement with the public. In these ways communication, the interaction between information, technology, and, most crucially here, people’s attitudes, values, and behaviours, brings both opportunities and challenges for transforming the rhetoric of emergency service organisations as accountable, learning organisations into reality. Such a move is supported by technological developments amongst other changes, including the expansion of social media and social networking. These changes have increased public expectation and participation in the ownership and sharing of information and in the interpretation and evaluation of the work of public servants and services involved in all aspects of emergency response.

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## Endnotes

<sup>1</sup>The Airwave Network is a mobile communications network dedicated for the use by the emergency services in Great Britain. Designed to be both secure and resilient, it allows multiple agencies' integrated communications through a nationwide network. See <https://www.airwavesolutions.co.uk/home/>

<sup>2</sup>The Freedom of Information Act of 2000 is a UK Act of Parliament that creates a public *right of access* to information held by public authorities. The Act creates a general right of access, on request, to information held by public authorities. On receipt of a freedom-of-information claim, a public authority has two corresponding duties: First, a duty to inform a member of the public whether or not it holds the information requested and second, if it does hold that information, to communicate it to the person making that request.

## About the Author

**Dr. Anne Eyre** is a sociologist and independent consultant specialising in psychosocial aspects of emergencies, major incidents, and disaster management. Her work focuses on the management and support of people with the aim of ensuring that the needs of people are at the heart of contingency planning, emergency response, and recovery. She is programme coordinator for the annual conference on fire-related research and developments supported by the Fire Service College, UK, and the Institution of Fire Engineers. Anne was recipient of the 2013 Dr. John Granito Award for Excellence in Fire Leadership and Management Research (presented at the Research Symposium, Tulsa (RS13)). Anne can be reached at [anne.eyre@traumatraining.com](mailto:anne.eyre@traumatraining.com)

Articles presented in this section of the Journal labeled **Fireground News** provide information useful to the well-being, safety, and/or professionalization of the fire service. As Editor of the *International Fire Service Journal of Leadership and Management (IFSJLM)*, I decide which articles are published in **Fireground News**. Usually, but not always, the articles were first presented as papers at the IFSJLM Research Symposium (RS) held annually in July at the International Fire Service Training Association Validation Conference.

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## *Annual Medical Physicals: Challenges and Opportunities*

### *Abstract*

*Firefighters face increased health risks related to cardiovascular disease, cancer, and other diseases because of exposures they encounter in carrying out their job duties, including fire-suppression and rescue activities and treating individuals with medical emergencies. Because of these exposures and disease risks, the need for medical exams has received increasing attention. While the importance of these exams is not debated, many departments in the United States (US) still fail to offer regular medical monitoring of their personnel. Given the lack of consistent implementation, it is important to understand perceptions and beliefs about these exams. Using interviews and focus groups, information from firefighters, fire chiefs, and fire service health-promotion personnel was collected about occupational medical exams. Personnel discussed benefits of and barriers to exams, as well as ways to effectively overcome barriers. Limitations to current exam programs in departments were discussed as well as department and medical-provider needs. Innovative methods for securing exams for firefighters also were discussed. Findings have important implications for planning and implementation of consistent medical programs for firefighters nationwide.*

**Keywords:** *firefighter medical exams, firefighter annual physicals, firefighter wellness*

### *Introduction*

The role of firefighters has evolved from a singular focus on fire suppression to now responding to a broad range of natural and manmade disasters and providing emergency medical and rescue services (US Fire Administration [USFA], n.d.). Given the broad range of tasks and extreme conditions in which firefighters sometimes have to work, it is not surprising that they face unique health challenges. As examples, fire fighting is associated with cancer (Daniels et al., 2013; LeMasters et al., 2006; Youakim, 2006), cardiovascular disease (Burgess et al., 2012; Fahs et al., 2011; Geibe et al., 2008; Kales, Soteriades, Christophi, & Christiani, 2007; Smith et al., 2012; Soteriades, Smith, Tsismenakis, Baur, & Kales, 2011), and high injury rates (Cloutier & Champoux, 2000; Craig, Congleton, Kerk, Amen-

dola, & Gaines, 2006; Jahnke, Poston, Haddock, & Jitnarin, 2013; Poplin, Harris, Pollack, Peate, & Burgess, 2012).

This improved understanding of firefighters' health risks has highlighted the importance of receiving annual medical exams to monitor health, provide early intervention, and prevent disease (International Association of Fire Fighters [IAFF], n.d.; National Fire Protection Association® [NFPA®], 2013). The National Fire Protection Association® (NFPA®) has published a standard on medical physicals for fire departments (NFPA®, 2013) that recommends annual exams for all firefighters. The standard outlines essential job tasks for firefighters in general as well as tasks for specialized teams. Recommended exams are comprehensive

and focused on physician evaluation and guidance for each system (e.g., neurological, cardiovascular).

Despite the recommendation that all firefighters have an annual physical and the obvious need for medical exams, more than a quarter of career (27.2%) and mostly career (28.4%) departments do not require medical exams. Among volunteer and mostly volunteer departments, even fewer provide physicals for their personnel (39.7% and 42.2% respectively) (Fischler, 2006). Recently, the Safety, Health, and Survival (SHS) Section of the International Association of Fire Chiefs (IAFC) has published a position statement and undertaken a collaborative summit with other fire service organizations to identify methods for implementing annual physicals for all firefighters (International Association of Fire Chiefs [IAFC], 2012). Given the clear need for regular medical exams and the dearth of departments that provide them, it is important to understand that challenges exist for the fire service in implementing effective medical-exam evaluation programs. Using qualitative methods, the current study sought to assess perceptions, beliefs, attitudes, and practices of a broad range of fire-service personnel regarding recommended medical evaluations.

## Methods

The current analysis is from data collected as part of a national qualitative study of fire service personnel's perceptions about health and wellness issues facing firefighters (Jahnke, Poston, & Haddock, in press; Jahnke, Gist, Poston, & Haddock, in press; Jahnke, Poston, Jitnarin, & Haddock, 2012; Poston, Haddock, Jitnarin, & Janhke, 2012). Data were collected from firefighters, fire chiefs, medical directors, and fire service

leaders. Funding for the project was from the American Heart Association, National Center. Protocols were approved by relevant institutional review boards (IRBs).

## Fire Department Solicitation

Department selection was conducted using a purposive sampling approach (Shadish, Cook, & Campbell, 2001) with the intent of capturing a range of departments and personnel with regard to department size, region of the country, and type of department (e.g., career, volunteer, combination). Departments were primarily solicited through an article in *Fire Chief* magazine (Pyle, 2008), recommendations from fire-service advisors, and a focus group at a national fire-service conference. In all, 34 departments were represented in the final sample.

## Participants

Demographics closely mirrored the demographics of the fire service, with most personnel being male and Caucasian (Fox, Hornick, & Hardin, 2006) (see **Table 1**). Personnel were from volunteer, career, and combination departments. Most leaders were fire chiefs, with some chiefs designating another representative from the department.

## Focus Group/Interview Protocols

Focus groups took place with firefighters while on duty, typically with intact crews. Interviews with leadership were typically conducted on an individual basis. All sessions began with an introduction of the investigative team and an explanation of the study protocol. Participants were allowed time to ask questions before

**Table 1. Demographic and Occupational Characteristics of Personnel.**

Demographic	Career (N=295)	Volunteer (N=48)	Combination (N=80)
Age (years)	41.8 <sup>a</sup> (10.6) <sup>b</sup>	37.1 <sup>a</sup> (14.9) <sup>b</sup>	38.9 <sup>a</sup> (12.7) <sup>b</sup>
Gender (% male)	93.2	79.2	87.5
Race (% Caucasian/White)	64.8	97.9	92.5
Hispanic Origin (% yes)	6.5	0.0	3.8
Occupational			
Time in the Fire Service (Years)	15.6 <sup>a</sup> (9.3) <sup>b</sup>	16.0 <sup>a</sup> (11.6) <sup>b</sup>	14.3 <sup>a</sup> (11.2) <sup>b</sup>
Rank/Position in Fire Department (%)			
FF/FF paramedic	56.0	64.4	66.3
Company Officer	23.7	13.3	20.1
Chief	15.4	17.8	11.3
Other Personnel	4.7	4.4	2.6

<sup>a</sup> Mean

<sup>b</sup> Standard Deviation



signing the IRB-approved consent forms. Protocols for both interviews and focus groups covered a broad range of health-related topics, but were allowed to evolve based on the interests of the participants. Questions included the following domains: (1) general perceptions of health and wellness, (2) physical fitness, (3) nutrition and the food culture in the fire service, (4) tobacco use, (5) alcohol use, (6) sleep challenges, (7) safety and seatbelt use, and (8) health-related policies and programs for firefighters. Themes related to annual medical physicals typically evolved from questions related to fitness evaluations and what departments do to benefit health.

### Analytic Approach

All session recordings were transcribed verbatim to allow for thematic analysis by the scientific team. For the first step, transcripts were divided by department type and interviewee (firefighter or leader) so sessions could be analyzed separately. Transcripts then were uploaded to *NVivo* (*NVivo*, n.d.), a computer software program designed to assist qualitative data analysis. Next, a researcher identified any quotes related to medical physicals. Then, a member of the investigative team who served as a facilitator in nearly all of the groups reviewed the transcripts for emergent themes. General themes were *parent* nodes and more specific subthemes within each code were noted as *child* nodes. Example statements were recorded. Finally, an additional member of the research team who attended most of the sessions and was familiar with the transcripts reviewed the summary results. Areas of divergence were discussed and revised. Summaries of the emergent themes are in the sections that follow.

### Results

Research results are organized into six topics. First, the benefits of medical physicals are discussed. Next, barriers to implementing physicals exams are identified. The third topic examines themes to overcoming perceived barriers to the use of physical exams in the fire departments. The fourth topic discusses limitations in the use of medical physicals. The last two topics concern needs related to service providers and to fire departments in the use of physical exams.

#### Benefits of Medical Physicals

A number of benefits to medical physicals were noted both for personnel and departments. In particular, benefits for personnel included (1) the early detection of diseases, (2) improvement in overall health, and (3) the ability to monitor improving or declining health risks. Some firefighters felt that the medical exams motivated them to improve their health. Exams also were identified as a strong teachable moment for personnel who need to make improvements or changes in their health

behaviors. Volunteer firefighters noted that the department's investment in their health made them feel more valued by their department.

Physical exams also were seen as benefiting the safety of the crew because personnel most at risk were identified and encouraged to make improvements in their health. Beyond the benefit to personnel, some other identified benefits to the departments typically related to lower injury rates, greater productivity, and reduced insurance premiums. Annual physicals could also allow departments to track progress and trends with personnel (e.g., body-mass index, hypertension) as a way of directing intervention efforts.

#### Implementation Barriers

While there was a strong consensus about the benefits of annual medical exams for firefighters, a number of barriers to implementation also were identified. Buy-in from personnel was one of the most common concerns because firefighters often are concerned about negative findings from the exams and the implications for how these findings would be handled. In particular, there were concerns about the limited pool of volunteer firefighters in rural areas and that those who have volunteered may not always pass the exams. Cost also was identified as a significant barrier because comprehensive and relevant exams with a qualified provider were seen as cost-prohibitive for many departments. The time involved in getting the exam was the last barrier identified, particularly for volunteer firefighters from rural areas who often have to travel long distances to see a physician.

#### Ways to Overcome Barriers

While barriers sometimes seemed insurmountable to personnel, several recommended courses of action as well as successful means for overcoming barriers were identified by both firefighters and leaders. It should be noted that while a good deal of concern was raised about the implications of medical exams and firefighters' concern about their implementation, personnel in departments with regular exams were overwhelmingly positive about their utility. Many individuals reported feeling that the exams were an indication of the department's investment in their health. While the introduction of exams often was met with initial skepticism, well-implemented programs eventually led to satisfaction and acceptance from firefighters. Keys to this success were the importance of ensuring confidentiality of individual findings as well as educating providers on the importance of this confidentiality. A successful mechanism for providers to follow up and provide feedback to departments was necessary before implementation. A number of specific themes related to overcoming barriers emerged from the sessions are discussed in the three sections that follow.

**Successful messaging.** It was repeatedly noted that the messaging and planning related to implementation of physicals are keys to its acceptance among firefighters. Most importantly, the motivation of a medical exam program should focus on keeping people working. While negative health findings are possible, the focus should be on fixing identified problems and returning personnel to work. The medical-exam program should also be framed as a benefit for firefighters that they can expect from their department, given the health risks they face in the line of duty. Education about the benefits of medical exams and the role they can and do play in maintaining overall health also is important in engaging firefighters in the process. Some examples are as follows:

- Study participants noted that sharing success stories of firefighters whose lives were saved by medical testing and early intervention was particularly motivating for personnel.
- Messages that highlighted the shared risk factors of crews seemed to be effective in helping firefighters accept the introduction of medical exams.
- Study findings showed that while firefighters are at times not motivated to make changes to improve their own health, they are motivated to improve their health to decrease the risk of injury to other crewmembers.
- Finally, the study found that the appropriate education of firefighters about what tests they receive, why they are receiving them, and what risks are being considered is important for a program to be accepted.

**Cost management.** Several departments started their medical-exam programs with grant funds. In particular, many departments had secured funding through the Federal Emergency Management Agency's (FEMA's) Assistance to Firefighter Grants program, and some departments were able to continue the program once it was initiated. Some departments that were unable to provide annual medical exams for all personnel developed a system of tiered periodic evaluations based on age and/or job duties. Some examples are as follows:

- Some chiefs indicated that they were able to justify their choice to implement programs and gain support by identifying cost savings related to having healthier personnel.
- It also was noted that making exams and/or related expenses a budget-line item, when possible, made eliminating exams in subsequent years more difficult.
- Smaller departments sometimes partnered with neighboring departments to negotiate costs with providers or partnered to share a provider.

- To defray costs and to manage the challenges of time constraints for some firefighters, departments reported contracting with providers to provide on-site medical exams using a mobile clinic.

**Successful processes.** One prominent suggestion to implement medical exams was to get personnel from all levels of the department involved in the planning and development process. The engagement of both labor and management was identified as key; and, in particular, framing the exams as a necessary benefit for personnel was viewed as a positive step. Some departments used the development process as a way to educate firefighter leaders on the importance and impact of the program. These firefighters then were tasked with educating their colleagues. The availability of in-house resources leading up to and after the exams also was noted as a key component of success.

### Limitations to Medical Physicals

While benefits to periodic medical exams were recognized, a number of limitations were reported by firefighters and leaders alike. Some departments, typically due to costs, have had to implement *minimal physicals* where only selected tests or screenings were utilized. It was noted that the physicals in these departments often missed key health risks. Lack of follow-up and lack of information or resources on how to improve health risks often were not included in exam results, which were identified as key limitations by some participants. Some providers did not offer appropriate or effective explanation of exam findings to personnel, which left these individuals questioning the utility of the exam itself. In some instances, firefighters were provided initial but no follow-up exams, which limited enthusiasm for the overall benefit to personnel.

### Needs Related to Service Providers

While having a local physician with expertise in firefighter health was clearly the preference for medical exams, such an arrangement was not always possible. In some instances, departments were able to employ a full-time provider, which respondents noted was an ideal situation for both annual exams and overall health. Participants perceived greater benefits to themselves and their organizations when healthcare providers were local and more embedded in the department. However, some respondents noted that often the *low bid* from a local physician determined who provided services, and the individual or group selected did not always have the requisite knowledge and experience. Some participants reported that departments relied on personal physicians to provide screenings and medical clearance. While this approach was cost-effective in many instances, some study participants expressed concern about the lack of education and knowledge among these physicians about the specific duties and strains faced by firefighters.

Due to the variation in healthcare providers being utilized, a number of needs related to education of providers were noted. For instance, information and training for providers on the risks that firefighters face were needed for those who were not specifically familiar with firefighter health. It also was noted that education on what assessments to conduct for firefighters was lacking for those without specialty training in occupational health. Education on managing abnormal findings also was noted as a specific need for providers. Specifically, physicians needed resources for effective methods for improving health and wellness to be able to provide information to firefighters who needed to make health changes.

### Needs Related to Fire Departments

Fire departments developing and implementing plans for medical exams identified a number of needs. For instance, some department personnel expressed the desire to have better information on how to find a qualified healthcare provider. Others noted that it would be helpful to have suggestions of model Standard Operating Guidelines (SOGs) on wording and processes that have been effective. Also needed were examples of successful programs from a variety of department settings. Guidelines and suggestions on tiered assessments for those departments that are not able to afford full annual medical exams were noted as additional needs. Some departmental personnel indicated that they wanted documentation for justifying the benefits and cost effectiveness of long-term exam programs to share with city officials.

### Discussion

This study focused on the benefits of medical monitoring for firefighters, identified barriers to implementing medical exams and how to overcome these barriers, discussed limitations of implementing physical-exam programs, and outlined the needs of both providers and departments with respect to medical exams. There was a consensus among study participants that medical exams are useful and necessary for firefighters, given the occupational risks they face on the job. Exams were seen as important for detecting health concerns early, monitoring overall health, as well as an ideal time for motivating healthy behaviors. Barriers to implementing medical exams included the cost of the exams, time challenges, access to care, and concern among firefighters about losing their jobs due to negative health findings. While there were some perceptions that such barriers were insurmountable, some study participants shared stories about overcoming barriers and successfully implementing medical-exam programs. In particular, it was noted that the concerns related to physicals and the impact these exams have on employment were generally unfounded and that

implementation of medical-exam programs was nearly universally accepted as positive once departments implemented them. Study participants noted that it was important that the program development be a collaborative effort between management and key labor personnel who can advocate and educate personnel about the exams. Cost concerns were reportedly overcome by seeking external funding (e.g., FEMA grants). Several innovative methods also were noted for cutting costs such as partnering with neighboring departments or contracting for onsite physicals.

In addition to the discussion about benefits and barriers to implementing medical-exam programs in fire departments, several themes emerged relating to limitations of exams and the needs of medical providers and fire departments in developing exam programs. In general, concerns were expressed about departments that did not have funding for fully NFPA®-compliant physicals every year for all members from an occupational medicine physician. There was concern about the implementation of exams that were not NFPA® compliant as well as lack of follow-up to exams that were completed. Study participants also suggested that clinical providers would benefit from a better understanding and knowledge about the specific physical demands of fire fighting. There also was discussion about the best and most effective screenings for firefighters as well as need for direction on which screenings should be used at what ages for departments that could not afford full physicals every year. Fire-department needs focused on finding the appropriate providers, developing SOGs, and helping with the cost/benefit analysis to support funding. While discussion about annual medical exams was generally positive, several unmet needs and opportunities for improvement were noted by study participants.

Findings highlight the importance of targeted efforts for firefighters to receive appropriate annual physicals as well as appropriate follow-up and intervention. Results can be used by organizations such as the SHS Section of the IAFC as well as individual departments as a resource for identifying both barriers and opportunities related to program implementation. Findings also suggest the need for resource development for both providers and fire-department personnel.

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## *Cost Analysis of Injury Claims in the Fire Service<sup>1</sup>*

### *Abstract*

*The objective of this study was to describe direct and indirect costs of injury claims in a suburban fire district. Primary data were provided by workers compensation (insurance) reports, fire district human-resources records, and in-person interviews with personnel from both organizations. The study population consisted of all fire district employees who filed injury claims from July, 2007, through June, 2013. Main outcome measures included workers compensation insurance premiums and experience rating; fire district medical expenses (second-opinion consults and exams) and paid indemnity (wages and benefits paid while the injured worker is on modified duty or off duty); and other fire district costs including backfill replacement (or rover) and administrative, investigative, and (re)training costs. Results of the analysis showed that fire district uninsured costs for injuries were on average 53% of its insurance premium costs and approximately equal to the total workers compensation claims costs.*

**Keywords:** *fire service, injury claims, cost analysis, direct cost, indirect cost, risk management*

### *Introduction*

The fire service is a high-risk industry. An estimated 70,090 injuries occurred among the 1.1 million career and volunteer firefighters in the United States (US) in 2011, a rate of 6.4 injuries per 100 firefighters (Karter & Molis, 2012; Karter & Stein, 2012). Other research reports annual injury rates range as high as 18 per 100 firefighters (Poplin, 2012). Although the cost of each injury varies widely, published average values range from \$7,486 to \$14,306 (Walton, Conrad, Furner, & Samo, 2003; Leffer & Grizzell, 2010), transformed to 2013 US dollars using the Consumer Price Index (Bureau of Labor Statistics, 2013). In 2005, the national cost of injury and injury prevention in the US fire service was estimated to be \$2.8 to \$7.8 billion per year (Teradata Corporation, 2005).

The total cost of injuries to a fire department includes direct costs (typically insurance premiums, wage replacements, and medical expenses) and indirect costs (such as administrative, investigative, and backfill replacement [or rover] costs). In other industries, estimates of the indirect costs range from 0.5 to 20 times the employee's wage (Andreoni, 1986; Oxenburgh & Marlow, 2005); 0.75 to 4 times the firm's direct cost of injury (Oxenburgh, 1997; Sun, Paez, Lee, Salem, & Daraiseh, 2006); and up to 3.5 times the

medical costs (Leigh, Markowitz, Fahs, & Landrigan, 2000). Currently, there is a paucity of studies of injury costs in the fire service and even less information on indirect costs. Having more complete fire service injury-cost information is essential for the economic evaluation of health and safety programs, particularly for estimating the likely return on investment (ROI) for competing intervention options such as injury-prevention and loss-control programs.

The purpose of this study is to further and more fully characterize fire service injury costs. The main objective is to describe direct and indirect costs of injury claims in the Northwest Fire District (NWFD), a suburban fire service in southern Arizona. An additional objective was to develop cost multipliers using data easily accessible to the fire service to help estimate department-level indirect costs and predict the potential benefits of cost-saving measures and injury risk-prevention strategies.

### *Setting, Data, Definitions, and Statistical Analysis*

The next four sections discuss the methodology of this study. Specifically, the setting (area and population), data sources, study definitions, and methods of the statistical analysis are presented.

## Setting

From 2010 to 2013, NWFD provided emergency and community services to over 110,000 residents and 3,300 commercial occupancies over a 140-square-mile area (Northwest Fire District [NWFD], 2013). Between 2006 and 2013, NWFD employed an average of 190 emergency service personnel (ESP), ranging from 186 to 196. The shift schedule is 24 hours per shift, on one day and off the next on a six-day rotation, then off for four days. The work year is divided into 28-day periods during which the ESP will work 9 to 10 shifts. Each person always has at least 2,756 scheduled regular-duty hours per year (2,990 hours/108 shifts). The mandated overtime shifts vary from 124 hours to 172 total hours per year.

## Data

The State Compensation Fund Arizona (SCFAZ, hereafter abbreviated as SCF) provided claims-analysis reports on basic accident factors from July, 2007, to July, 2013. The SCF analysis reports were divided into fiscal years beginning July 1 and ending June 30 of the following year. A total of 325 injury claims were reported over this six-year time period. NWFD Human Resources personnel provided records (i.e., for backfill replacements of shifts from lost-time and modified-duty injuries and administrative costs) within the same time period. The effect of injury claims on NWFD's two-year experience modification rating (EMOD factor) and state insurance premiums were also analyzed. EMOD is used to predict future premiums based on past experiences. A neutral injury and expense history equals an EMOD of 1.00. A history of higher expenses and injuries increases the EMOD. Thus, an EMOD factor of 1.24 means that an additional 24% of the estimated annual premium (gross payroll multiplied by the rate per \$100 of wages) was added to the cost of the annual premium. All figures were adjusted to June, 2013, US dollars, using the Consumer Price Index (Bureau of Labor Statistics, 2013).

The mapping approach followed by Jallon, Imbeau, and de Marcellis-Warin (2011b) was used to graphically represent NWFD's response to injuries and to determine how the district spends its time and resources. First, the injuries were categorized by outcome, for example, injuries requiring medical care with or without lost time from work. The categories were further subdivided into injuries resulting in modified duty or no modified duty. After the personnel involved were identified in the process map, wage rates were applied and multiplied by the duration of involvement, yielding an estimate of the indirect costs for each injury outcome.

NWFD provided more detailed information on 10 injury claims from April, 2012, to April, 2013, including 7 lost-time and 3 no-lost time injuries, for further analysis of indirect costs. The cases were arbitrarily selected by NWFD staff as *common injury claims*. Case-study subjects included four firefighters, two fire paramedics, two

fire engineers, one battalion chief, and one fire captain. Information on response to injury was collected by in-person interviews with NWFD staff, specifically the Human Resources Specialist and the Health and Safety Division Chief. Backfill replacement costs for the 10 case reports were provided by the NWFD Scheduling Officer and Director of Finances, who reported individual wage rates.<sup>2</sup>

## Definitions

Direct and indirect costs of claim injuries to NWFD and SCF are summarized in **Table 1**. Key concepts are as follows:

- **Direct Costs** — Direct costs of injuries to NWFD included medical expenses (second-opinion consults and exams), paid indemnity (wages and benefits paid by NWFD while injured worker is on modified duty or off duty), and SCF insurance premiums. Direct costs to SCF (medical and paid indemnity) were included because this detailed information by body part and nature of injury are provided by SCF to NWFD and could be used by NWFD to easily determine differences in costs among various injury types. Furthermore, the direct costs to SCF are used to calculate the EMOD factor and the projected insurance premium.
- **Indirect Costs** — Indirect costs of injuries to NWFD included backfill replacement, administration, investigations, and training. These data were provided from the 10 injury claims discussed previously and as discussed in greater detail in the section entitled Case Study Analysis and Backfill Costs. Indirect costs to SCF were not considered in this analysis as they were not provided to NWFD and were not considered helpful to NWFD in evaluating its injury costs.
- **Lost-Time Injury Claims** — According to NWFD standard operating procedures, lost-time injury claims concern “any district employee [who] has received any injury or an illness while on duty, has completed all the proper State Industrial Injury paperwork, and has missed work or may miss work in the future due to the injury or illness” (Northwest Fire District [NWPD], 2010, p. 1). These types of claims are classified as *Indemnity Claims*, encompassing cases in which the injured worker received State Workers Compensation (wage replacement and medical benefits). Wage replacements are provided by SCF and by NWFD at varying ratios for these types of claims, depending on the length of time off duty.
- **No Lost-Time Injury Claims** — No lost-time injury claims are filed for industrial injuries that resulted in no lost time from work. These types of claims include (1) *Medical-Only*, which



encompasses *Modified Duty-Only*, meaning the injured worker received medical benefits and performed modified-duty assignments without any lost days from work, and (2) *No Modified Duty*, in which case the injured worker continued with his or her regular duties. Any wage replacement is provided 100% by NWFD in these cases.

**Table 1: Direct and Indirect Costs to NWFD and SCF.**

	Direct Costs	Indirect Costs
Fire District	<ul style="list-style-type: none"> <li>• Paid indemnity (wages &amp; benefits paid by fire district while injured worker is on <i>modified</i> duty OR <i>off</i> duty)</li> <li>• Medical (2nd-opinion consults and exams)</li> <li>• Insurance premium</li> </ul>	<ul style="list-style-type: none"> <li>• Backfill replacement</li> <li>• Administration, Investigations</li> <li>• Training for missed sessions.</li> </ul>
Insurance	<ul style="list-style-type: none"> <li>• Paid indemnity (wage replacements only while <i>off</i> duty)</li> <li>• Medical expenses</li> </ul>	N/A

### Statistical Analysis

Injury claims were categorized by outcome, including number of days away from regular work duty, modified-duty days, and off-duty days. Based on SCF claims analyses from 2007–2013, the annual incidence of injury claims, mean insured medical costs, and mean workers compensation costs of injury claims were estimated over this time period using Microsoft Excel 2010.

For the 10 injury claims provided by NWFD that were used for the case-study analysis, paid indemnity by NWFD was calculated based on the number of days off regular duty. For injury claims resulting in less than 2 weeks off duty, NWFD paid 100% of regular wages for the first 7 days, 33 1/3% of the regular wages for days 8 to 13, and benefits (22.52% of wages) for the full time period. For injury claims resulting in greater than 2 weeks off duty, NWFD paid 33 1/3% of the regular wages from day one and benefits for the full time period. Injured workers on modified duty received 100% of their regular wages and benefits from NWFD. Wage rates for the personnel identified in the process map (namely, backfill replacements) were applied to estimate indirect costs in 2013 dollars. Backfill costs were calculated using **Equation 1**, based on information provided by NWFD:

#### Equation 1. Calculation of Backfill Costs

$$\text{Backfill Costs} = 1.5 \times \text{Normal Hourly Wages} + \text{Benefits}^*$$

(\*Benefits = 16.29% PSPRS<sup>†</sup> + 4.78% workers compensation + 1.45% Medicare = 22.52% gross wages)

[<sup>†</sup>Source: Arizona Public Safety Personnel Retirement System (PSPRS), 2013]

Total annual paid indemnity by NWFD was estimated for 2007–2013 by multiplying the average paid indemnity in each of the four categories of injury claims in the case studies times the number of claim types each year. Likewise, total annual backfill costs were estimated by using the data from the case studies and the number of each claim type. According to the Human Resources Specialist at NWFD, about three in four cases require an evaluation by another specialist such as an orthopedist. Annual medical expenses paid by NWFD were approximated as \$65 per medical visit multiplied by three-fourths of the yearly sum of injury claims. The estimate of NWFD annual medical expenses also includes two hours of travel time and time off during the medical visit. Annual estimates of administrative and investigative costs were provided by the NWFD Health and Safety Officer (HSO).

### Findings

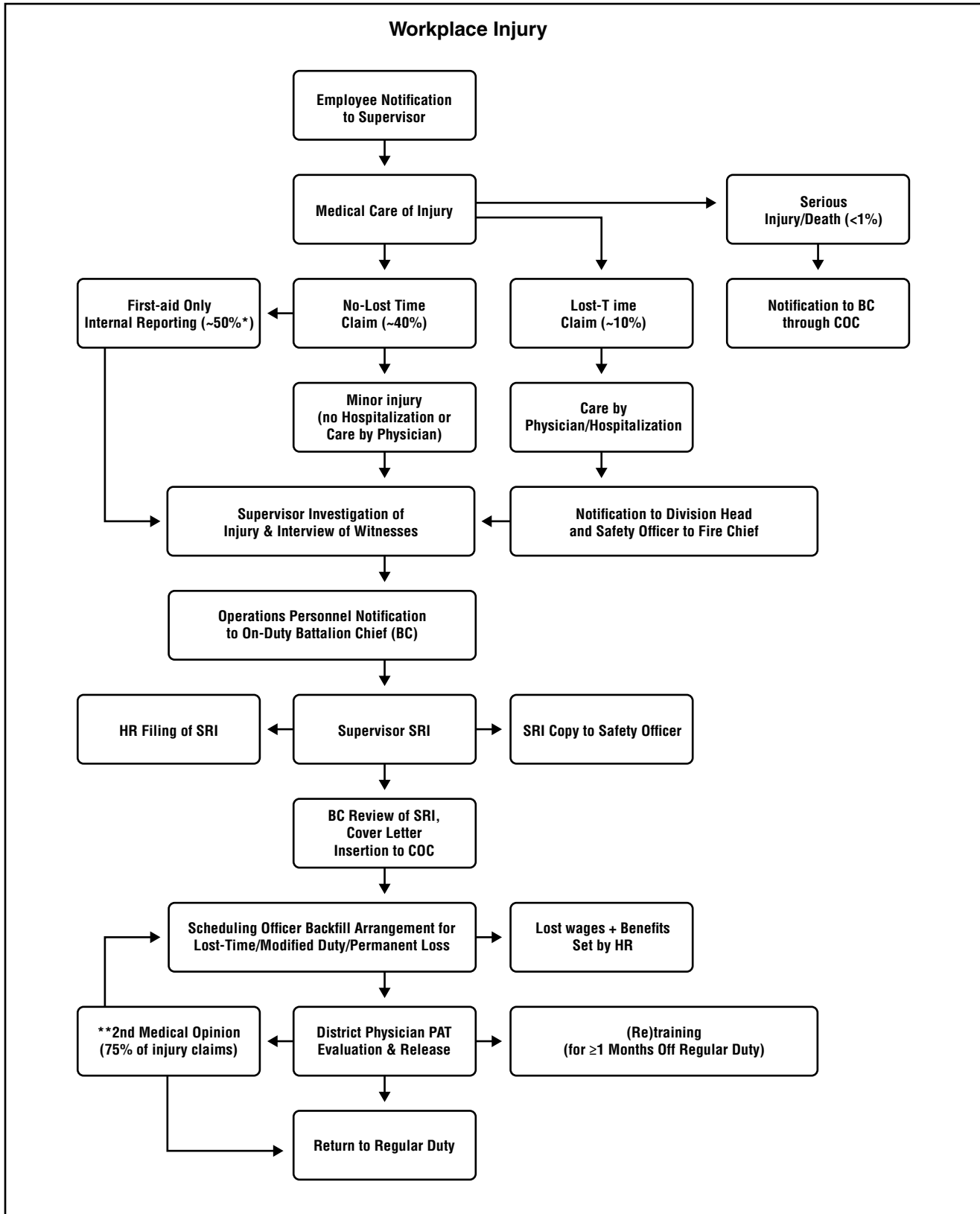
Findings are organized into eight sections: injury claims process, analysis of SCF costs, case study analysis and backfill costs, insurance costs, costs of accident investigations (AIs), other administrative costs, training costs for lost time, and additional NWFD costs.

### Injury Claims Process

**Figure 1** (p. 32) provides an overview of the NWFD injury claims process, including the *3804 Employee Injury Standard Operating Procedures* for the first 24 hours after injury and return-to-work procedure. All injuries first require employee notification of the event to the supervisor. Once appropriate medical care is received, the injury may be classified as *first-aid* only or reported to the state insurance company as a claim resulting in either lost time or no lost time from work. The other much less common category includes serious injuries resulting in permanent disabilities and fatalities. Requisite forms are completed by the injured employee, if possible, and the supervisor. Human Resources personnel process the forms, which are also reviewed through the chain of command and the Health and Safety Officer.

For any duties that result in lost time, modified duty, or permanent losses, the Scheduling Officer arranges backfill replacements. Human Resources personnel also arrange for the payment of replacement wages and benefits and follow-up on medical exams and specialist consults. If an employee has been off regular duty for at least a month, he or she may require remedial training before returning to work. All employees who have lost time from their regular assignments must eventually see the NWFD occupational physician, although a second medical opinion by another specialist is required in 75% of injury claims (particularly those involving the back, knee, shoulder, or heart). After the employee passes the physical-abilities test and receives a physician's release, he or she may return to regular duty.

Figure 1: Overview of Injury Claims Process.



(Adapted from Northwest Fire District (NWFD). (2010). 3804 Employee injury standard operating procedures, unpublished document. Tucson, AZ. The process is for the first 24 hours after injury and return-to-work procedures.)

\*Estimated percent of total reported injuries to NWFD, provided by HR.

\*\*For second medical opinions, NWFD pays \$65 per office visit with the medical specialist. NWFD also pays for an injured employee's lost time during this procedure, taking a minimum of two hours for travel and the physician's visit.

**Terms:** SRI = Supervisor's Report of Industrial Injury, BC = Battalion Chief, COC = Chain of Command (up to Division Chief), HR = Human Resources at NWFD, PAT = Physical Ability Test

The data on injury-claim statistics are managed by SCF, which provides an annual electronic report the first day of July. Human Resources personnel at NWFd manage the data for internally reported injuries (first-aid only, near misses) as well as all backfill and administrative costs.

### Analysis of SCF Costs

**Table 2** summarizes the annual frequency and costs of all NWFd injury claims to SCF for fiscal years 2007 to 2013. The estimated average cost to SCF per injury

claim is \$4,776 (\$257,912 in average annual injury costs divided by an average of 54 claims per year). Medical-only claims are over 3.7 times as numerous as indemnity claims and paid medical-only costs exceed indemnity costs by approximately 2.5 fold.

In **Table 3**, the annual incidence of injury claims is organized by body part with the total incurred costs by SCF for fiscal years 2007 to 2013. Back, followed by knee and shoulder, injuries are the most expensive with indemnity costs far exceeding medical-only claims.

**Table 2: Summary of All Workers Compensation Claims at NWFd and Costs to SCF (Fiscal Years 2007 to 2013).**

Fiscal Year (FY)	Number of Employed ESP*	Number of Indemnity Claims	Number of Medical-Only Claims	Paid Indemnity (A)	Paid Medical (B)	Loss Reserves (C)	Expense Incurred (D)	Total Incurred (A+B+C+D)
2007–2008	186	8	44	\$8,894	\$68,990	\$0	\$634	\$78,519
2008–2009	188	16	63	\$189,829	\$321,848	\$223,769	\$19,344	\$754,790
2009–2010	189	9	44	\$17,424	\$127,301	\$0	\$5,485	\$150,210
2010–2011	196	12	39	\$33,175	\$146,654	\$3,977	\$6,303	\$190,108
2011–2012	192	13	46	\$49,111	\$110,453	\$55,334	\$22,583	\$237,481
2012–2013	191	10	21	\$10,064	\$40,566	\$84,449	\$12,148	\$147,227
Sum	N/A	68	257	\$304,967	\$808,158	\$367,190	\$67,153	\$1,547,469
FY avg	190	11	43	\$50,828	\$134,693	\$61,199	\$11,192	\$257,912
Std Dev	3.5	3	13	\$67,552	\$95,720	\$84,923	\$8,682	\$240,236
Median	190	11	44	\$25,195	\$119,559	\$30,552	\$9,505	\$172,199

\*ESP = Emergency Service Personnel (at NWFd) measured at mid-fiscal year (December). **Notes:** Data obtained from NWFd Human Resources, June, 2013, and SCF Claims Analysis Reports 2007–2013. All figures were adjusted to June, 2013, US dollars using the Consumer Price Index. **Terms:** *Paid indemnity* is wage replacements covered by SCF to injured employees with lost time. *Paid medical* is medical care payments covered by SCF. *Loss reserves* are the expected additional costs to SCF for an open claim. *Expense incurred* includes other bills to SCF not directly charged to NWFd, for example, the cost to order an independent medical examiner.

Average cost to SCF per injury claim: \$257,912/54 claims per year = \$4,776 (2013 U.S. dollars)

**Table 3: Injury Claims by Body Part and Costs to SCF, for Fiscal Years 2007 to 2013.**

Body Part*	Total n	Indemnity Claims				Medical-Only Claims			
		n	Annual Avg.	Min	Max	n	Annual Avg.	Min	Max
Back	60	17	\$84,118	\$1,551	\$349,243	43	\$11,913	\$5,438	\$21,222
Shoulder	28	12	\$49,918	\$0	\$191,807	16	\$5,311	\$740	\$13,389
Knee	34	11	\$45,079	\$12,155	\$103,352	23	\$5,456	\$0	\$11,216
Hand	27	4	\$9,332	\$0	\$37,976	23	\$3,512	\$0	\$8,392
Abdomen	16	3	\$4,951	\$0	\$17,843	13	\$4,462	\$0	\$12,548
Foot	12	5	\$7,300	\$0	\$22,783	7	\$1,141	\$0	\$4,279
Wrist	11	3	\$3,954	\$0	\$7,121	8	\$996	\$0	\$1,784
Arm	14	2	\$3,187	\$0	\$22,306	12	\$942	\$436	\$2,219
Ankle	16	3	\$1,274	\$0	\$4,908	13	\$2,535	\$0	\$10,045
Body Systems	25	1	\$0	\$0	\$1	24	\$3,197	\$0	\$15,420

\* Table 3 includes only the first 10 categories of injuries by body part, in order of decreasing average annual costs to SCF. **Terms:** n = number of injury claims at NWFd from fiscal years 2007–2013; Avg. = average. Data were adjusted to 2013 US dollars. **Note:** All other claims during this time period accounted for ≤15 claims per year by body part and ≤\$1,214 in average annual costs to SCF. A total of 325 claims were reported during this time period, costing SCF \$1,547,469 (Table 2).

**Table 4** shows the annual incidence of injury claims arranged by the mechanism of injury with the total incurred costs to SCF for fiscal years 2007 to 2013. Strain and other related injuries result in the greatest costs.

With regards to additional costs to SCF, an employee whose injury precludes unlimited duty as a firefighter is sent to an independent disability medical examiner, who rates his or her impairment from 0 to 100% based on the American Medical Association (AMA) *Guides to the Evaluation of Permanent Impairment*, 6th Edition (American Medical Association [AMA], 2007). Based on the impairment rating, SCF awards a lump sum or money in stages. *The Supportive Care Award* comes out of the SCF reserve and pays for rehabilitation, follow-up exams, and other medical expenses after the case has been closed to further active medical treatment. The analysis of costs to NWFD did not include such expenses as none occurred during the study period.

### Case Study Analysis and Backfill Costs

**Table 5** shows a sample of 10 cases of injury claims at NWFD from April, 2012, to April, 2013, including 7 with lost time and 3 with no lost time. Each case is identified with a description of the injury, the number of days off or on modified duty, backfill costs, and paid

indemnity/medical costs for SCF and NWFD. The main purpose of the case studies was to estimate the backfill costs for each category of injury (lost-time versus no-lost time, with or without modified duty). Backfill costs include compensation costs (wages plus benefits) paid when a member is either off work or on a modified-duty assignment for an on-duty injury. In addition, for each case, the regular hourly wage of the injured worker was provided by the NWFD Finance Director. A typical work day was described as 24 hours per shift (on one day/off the next on a six-day rotation, then off for four days; known in the fire service as a three-four schedule).

Of note, there are no backfill costs in some cases due to NWFD's use of on-duty paramedics and firefighter rovers who are available to fill an empty position, a common practice in the fire service. *Paid Indemnity by SCF* include workers compensation for lost time (days off duty) due to an injury. While NWFD covers one-third of the member's regular wages, SCF covers two-thirds, beginning on day one for lost time (days off) exceeding two weeks. Note that only Cases A and B have paid indemnity by SCF because only days 8 to 13 are covered by SCF if an employee is off duty for less than two weeks. Wages on modified duty are covered 100% by NWFD. *Paid Medical by NWFD* includes direct medical expenses of injury claims to NWFD, which essentially equaled

**Table 4: Injury Claims by Mechanism of Injury and Costs to SCF, for Fiscal Years 2007 to 2013.**

Injury Type*	Total n	Indemnity Claims				Medical-Only Claims			
		n	Annual Avg.	Min	Max	n	Annual Avg.	Min	Max
Strain or Injury...	64	19	\$57,214	\$13,707	\$86,305	45	\$14,429	\$2,693	\$28,809
On Same Level	8	2	\$29,616	\$0	\$173,563	6	\$1,258	\$0	\$3,438
Lifting	50	14	\$12,312	\$0	\$35,989	36	\$8,773	\$1,737	\$14,535
Jumping	5	2	\$12,051	\$0	\$72,303	3	\$848	\$0	\$3,333
Fall, Slip or Trip	9	5	\$9,075	\$0	\$40,164	4	\$2,574	\$0	\$13,206
Twisting	20	3	\$5,412	\$0	\$13,726	17	\$3,301	\$557	\$8,512
Flying or Falling Object	6	3	\$8,374	\$0	\$36,922	3	\$275	\$0	\$832
Holding or Carrying	8	5	\$6,723	\$0	\$25,241	3	\$580	\$0	\$2,113
Absorption, Ingestion, or Inhalation NOC	35	0	\$0	\$0	\$0	35	\$2,094	\$1,084	\$3,477
Contact with NOC	22	2	\$0	\$0	\$0	20	\$1,167	\$270	\$3,764

(Mechanisms of injury were determined by the Supervisor who filled out the report of injury.)

\* Table 4 includes only the first 10 categories of mechanisms of injury, in order of decreasing average annual costs to SCF. **Terms:** n = number of injury claims at NWFD from 2007–2013; Avg. = average; NOC = not otherwise classified. Data were adjusted to 2013 U.S. dollars.

All other claims during this time period accounted for ≤7 claims per year by mechanism of injury and ≤\$1,026 in annual costs to SCF, excluding one back injury claim “on stairs” in 2008 which cost SCF \$349,243. A total of 325 claims were reported during this time period, costing SCF \$1,547,469 (Table 2).

Table 5: Case Studies of Injury Claims at NWFD (April 2012 to April 2013).

Employee	# Days Off/ Modified Duty	Paid Indemnity by SCF	Paid Medical by SCF	Total Incurred by SCF	Paid Indemnity by NWFD (A)	Paid Medical by NWFD (B)	Backfill Cost (C)	Other Indirect Costs* (D)	Total Incurred by NWFD (A+B+C+D)
A	Off = 8, MD = 0	\$89.04	\$924.24	\$1,013.28	\$1,422.66	\$107.21	\$1,459.02	\$1,320.80	\$4,309.69
B	Off = 25, MD = 0	\$2,194.25	\$3,490.38	\$5,684.63	\$1,765.04	\$97.15	\$3,974.51	\$6,358.40	\$12,195.10
G	Off = 2, MD = 0	\$0.00	\$151.50	\$151.50	\$948.25	\$225.68	\$1,173.49	\$1,008.20	\$3,355.62
	Sum	\$2,283.29	\$4,566.12	\$6,849.41	\$4,135.95	\$430.04	\$6,607.02	\$8,687.40	\$19,860.41
	Avg	\$761.10	\$1,522.04	\$2,283.14	\$1,378.65	\$143.35	\$2,202.34	\$2,895.80	\$6,620.14
C	Off = 5, MD = 23	\$0.00	\$2,486.01	\$2,486.01	\$5,466.94	\$109.33	\$6,649.31	\$2,684.40	\$14,909.98
D	Off = 5, MD = 35	\$0.00	\$2,729.69	\$2,729.69	\$5,373.05	\$98.78	\$7,272.74	\$3,195.60	\$15,940.17
	Sum	\$0.00	\$5,215.70	\$5,215.70	\$10,839.99	\$208.11	\$13,922.05	\$5,880.00	\$30,850.15
	Avg	\$0.00	\$2,607.85	\$2,607.85	\$5,420.00	\$104.06	\$6,961.03	\$2,940.00	\$15,425.08
H	NLT	\$0.00	\$175.50	\$175.50	\$0.00	\$109.33	\$0.00	\$1,278.20	\$1,387.53
I	NLT	\$0.00	\$300.79	\$300.79	\$0.00	\$113.95	\$0.00	\$156.20	\$270.15
J	NLT	\$0.00	1891.75	\$1,891.75	\$0.00	\$98.67	\$0.00	\$156.20	\$254.87
	Sum	\$0.00	\$2,368.04	\$2,368.04	\$0.00	\$321.95	\$0.00	\$1,590.60	\$1,912.55
	Avg	\$0.00	\$789.35	\$789.35	\$0.00	\$107.32	\$0.00	\$530.20	\$637.52
E	Off = 0, MD = 1	\$0.00	\$1,938.64	\$1,938.64	\$141.73	\$97.18	\$0.00	\$930.20	\$1,169.11
F	Off = 0, MD = 22	\$0.00	\$2,181.71	\$2,181.71	\$4,090.60	\$107.21	\$8,967.93	\$2,102.00	\$15,267.74
	Sum	\$0.00	\$4,120.35	\$4,120.35	\$4,232.33	\$204.39	\$8,967.93	\$3,032.20	\$16,436.85
	Avg	\$0.00	\$2,060.18	\$2,060.18	\$2,116.17	\$102.20	\$4,483.97	\$1,516.10	\$8,218.43

\*Other Indirect Costs: Administrative (i.e. Paperwork, Scheduling, Follow-up), Investigative, +/- Training. **Terms:** A, B and G = lost-time (*indemnity claim*) injuries without modified duty; C and D = lost-time injuries *with* modified duty; H, I and J = no-lost time (medical only, no modified duty) injuries; E and F = no-lost time (medical only *with* modified duty) injuries; Off = off duty; MD = modified duty; NLT = no lost time.

Average "other indirect costs" for all injury claims: \$91,256/54 claims per year = \$1,690/claim (2013 U.S. dollars).

the cost of a second opinion by an Independent Medical Examiner — calculated as \$65 plus the member's regular hourly wage × 2.2252 (including benefits).

These values are summarized in **Equation 2**.

**Equation 2. Calculation of Total Incurred Costs by SCF**

*Total Incurred by SCF = Paid Indemnity by SCF + Paid Medical by SCF + Reserve\**

(\*Reserve for potential future costs, which equaled \$0 in these 10 cases)

### Insurance Costs

NWFD employees are insured for workers compensation benefits through SCF. The current insurance premium is based on the NWFD experience rating over the previous two fiscal years. The experience-rating number (*EMOD Factor*) is calculated by the NCCI (National Council on Compensation Insurance)

rating bureau. NCCI calculates the following values: expected loss rate, i.e., the expected losses expressed as a percentage of payroll for each classification code (employed or volunteer firefighter), EPL (expected primary losses), and EEL (expected excess losses) as shown in **Equation 3**.

**Equation 3. Calculation of EMOD Factor**

*EMOD Factor = (APL + AEL)/(EPL + EEL)*

(APL = Actual Primary Losses; AEL = Actual Excess Losses; EPL = Expected Primary Losses; and EEL = Expected Excess Losses)

NCCI sets the Expected Primary Losses (EPL) and Expected Excess Losses (EEL) incurred based on the class codes of the rate. These are different figures based on the industry, the number of employees, and the actual risks within the type of work. For high-risk industries such as the fire service, including NWFD,

the expected loss rate is 70% of the total premiums earned with an expected total incurred cost of claims to rise 15% (including reserved costs). Arizona is one of many states that uses the experience-rating adjustment, allowing SCF to include only 30% of medical-only claims in the EMOD calculation. The purpose of this adjustment is to decrease the incentive for employers such as NWFD to pay the small medical-only claims themselves and not report them to SCF. In addition, indemnity claims exceeding \$10,000 in incurred costs to SCF are excluded from the EMOD calculation in an attempt to help control the insurance premiums while still permitting an accurate statistical analysis.

In **Table 6**, the EMOD factors for NWFD’s insurance premiums over the fiscal years 2007 to 2013 are displayed for comparison, as well as the total incurred costs of injury claims to NWFD as a sum of columns A through D (Paid Indemnity by NWFD, Paid Medical by NWFD, Backfill Cost, and Other Indirect Costs). With an average annual insurance premium of \$489,807 and 54 claims per year, the mean cost of insurance to NWFD per injury claim is \$9,071, or \$2,578 (2013 US dollars) per ESP. The average annual total incurred costs to NWFD, including the insurance premium, is \$750,066. Claims with only Paid Medical expenses include injuries/illness that resulted in modified-duty assignments, covered 100% by NWFD. Thus, these figures are an underestimation of the actual costs to NWFD. For comparison, the EMOD factors for four fire departments of similar size in Arizona (provided by SCF) are 0.76, 1.09, 1.13 and 1.81. Other indirect costs are described in the next four sections.

### Costs of Accident Investigations (AIs)

NWFD conducts Accident Investigations (AIs) in an attempt to prevent a reoccurrence. National Fire Protection Association® (NFPA®) 1500, *Standard on Fire Department Occupational Safety and Health Program*, Chapter 4, states “all accidents, near misses, injuries, fatalities, occupational illnesses, and exposures involving members shall be investigated” (National Fire Protection Association® [NFPA®], 2013, p. 12). In addition, it is the policy of NWFD to investigate all accidents. AIs are scaled according to severity and the *uniqueness* of the event. They occur at three levels: (1) Emergency Medical Services (EMS) Captain or EC or Battalion Chief (BC), (2) Health and Safety Officer (HSO), and (3) team approach (3 to 6 members). These levels are in order according to the severity of the event, with three being the highest. The following lists describe the estimates regarding cost of each level of investigation for cases that resulted in injury claims:

- **Level 1: EC or BC** — Level 1 normally does not exceed 1 to 2 hours and normally done *on-duty*. EC or BC investigations are generally *no cost* other than the time taken away from other duties. The average number of investigations at this level is in the range of 25 to 35 each year (~30 Level 1 cases per year × 1.5 hours × \$39 BC hourly wage and benefits = \$1,755 average annual cost for Level 1 cases).
- **Level 2: HSO** — An investigation at this level averages 8 to 12 hours. The HSO typically tries to budget for about 20 hours of AI-related time

**Table 6: EMOD Factors, Insurance Premiums, and Other Costs to NWFD, for Fiscal Years 2007 to 2013.**

Fiscal Year	EMOD Factor	Annual Premium	Injury Claims (n)	Paid Indemnity by NWFD (A)	Paid Medical by NWFD (B)	Backfill Cost (C)	Other Indirect Costs* (D)	Total Incurred by NWFD (A+B+C+D)
2012–2013	1.24	\$618,804	31	\$44,424	\$2,764	\$67,795	\$86,957	\$201,940
2011–2012	1.1	\$514,872	59	\$68,013	\$5,349	\$109,306	\$88,409	\$271,077
2010–2011	1.18	\$451,539	51	\$62,856	\$4,759	\$100,110	\$91,008	\$258,733
2009–2010	0.9	\$462,244	53	\$55,801	\$5,047	\$92,928	\$92,856	\$246,632
2008–2009	0.98	\$382,413	79	\$92,103	\$7,592	\$149,744	\$93,721	\$343,161
2007–2008	1.01	\$498,493	52	\$53,386	\$5,068	\$90,091	\$95,049	\$243,595
Sum	N/A	\$2,938,842	325	\$375,627	\$30,414	\$607,982	\$547,536	\$1,561,555
Yearly Avg	1.07	\$489,807	54	\$62,604	\$5,069	\$101,330	\$91,256	\$260,259
Std Dev	0.13	\$104,411	17	\$16,439	\$1,612	\$27,741	\$0	\$39,142
Median	1.06	\$466,438	53	\$58,934	\$4,913	\$95,854	\$91,256	\$250,910

\*Other Indirect Costs: Administrative (i.e., paperwork, scheduling, follow-up), Investigative, +/- Training. All figures were adjusted to June 2013 US dollars, using the Consumer Price Index.

- Mean cost of insurance premium to NWFD ~ per injury claim: \$489,807/54 claims per year = \$9,071; ~ per emergency service personnel (ESP): \$489,807/190 ESP on average = \$2,578 (2013 US dollars).
- \$750,066 = Average annual total incurred by NWFD, including insurance premium.
- 1.9:1 Ratio of Average annual insurance premium to Total incurred by (uninsured costs to) NWFD.

each quarter or roughly 80 hours per year. Again, other than time that the HSO could be spending on other projects, there is no cost for the time that the HSO spends on investigations. The number of AIs done by the HSO varies but is relatively low, in the range of five to eight per year. The number of hours spent per case is higher than for Level 1 due to the more detailed nature of the AI at this level: ~60 hours total per year × \$65 HSO hourly wage and benefits = \$3,900 average annual cost for Level 2 cases.

- **Level 3: Team** — A recent example of a team investigating a severe exercise-induced injury included the following: (a) HSO, (b) Shift BC with a degree in occupational health/safety, (c) Health/Fitness Coordinator Shift Captain, (d) Peer Fitness Trainer Shift Captain, and (e) third-party consultant (doctor of physical therapy).

The estimated cost of overtime (for the Health/Fitness Coordinator and Peer Fitness Trainer) and the consultant was \$750 (mean cost per Level 3 case). The hours spent by the HSO and BC were approximately 30 and 15, respectively. NWFDF does not typically track the cost of these AIs, so there are limited historical data. However, the average range of indirect cost for this Level 3 type of investigation is likely to be \$500 to \$2,000, with a range of salaried staff time of 20 to 60 hours. The number of AIs at this team-investigation level is generally very low, at 2 to 4 per year, costing an annual ~3 Level 3 cases per year × \$750 (overtime and consultant) + 30 hours × \$65 (HSO hourly wage and benefits) + 15 hours × \$39 (BC hourly wage and benefits) + \$1,532 staff wages and benefits = \$14,451 average annual cost for Level 3 cases.

Combined, the total investigative costs for injury Levels 1 through 3 are \$1,755 + \$3,900 + \$14,451, or \$20,106/year.

### Other Administrative Costs

For claim injuries, the Human Resources Specialist is involved at all levels of injuries, which requires about 25 hours per week at an hourly wage of \$20 (\$25,000/year). While these services do not cost extra to NWFDF, they divert staff time that could be devoted to other assignments or projects; hence, this diversion is the reason they are labeled under *indirect costs*. These figures include the Human Resources Specialist's time following up with workers on completing medical exams and imaging, etc. The following administrative personnel at NWFDF are also involved in injury claims:

- **Training Division Chief** — \$58.81 hourly wages and benefits × 4 hours/week × 50 weeks = \$11,761/year. Other training staff: One at \$34.224/hour, one at \$38.486/hour, and one at \$21.768/hour × 4 hours/week × 50 weeks = \$18,896/year. Total training costs for lost-time injuries = \$11,761 + \$18,896 = \$30,658/year.

- **Scheduling Officer in Charge of Backfill Arrangements** — \$53.91 hourly wages and benefits × 4 hours/week × 50 weeks = \$10,782/year.

Combined, the total administrative costs are \$25,000 + \$30,658 + \$10,782 = \$66,440/year /54 cases = \$1,230/case. Combined total investigative and administrative costs are \$20,106 + \$66,440 = \$86,546/year.

### Training Costs for Lost Time

The training effort that is required for firefighters who are out for an extended period of time is variable. For a person missing work for a relatively short period of time (one month or so), the time involved to recover the training missed could be as simple as the station captain getting the member fully informed when he or she comes back on duty. For longer periods off, three months or more, training could involve time on a 40-hour Monday-through-Friday schedule, where the member would work under training staff direction to receive the instruction that he or she missed during that period of time. The amount of time needed varies, depending on what the firefighter missed and the complexity of the training. Likewise, the time associated with the training staff conducting this training for the individual is highly variable, depending on how much training was missed and the complexity of the subject matter. For a longer duration period, six or more months that a member is off, a range of 40 to 60 hours of training staff time is reasonable to expect to manage and deliver the missed training; in rare cases, up to 80 hours are required. Training *administrative* costs (supervision and management of the return-to-duty training program by the training division chief plus administrative assistant support) can be estimated at 10% of the actual training staff time. The training staff is on a regular 40-hours schedule so again, the cost to the organization is the lost time that they could be working on regular training-assignment programs.

### Additional NWFDF Costs

About two internally reported incidents (non-claim injuries, i.e., first-aid only and near misses) are reported per week (~100 yearly), involving at most one hour of the Human Resources Specialist's time and costing an annual average of \$2,000 to NWFDF. Staff time for the EC, BC, and HSO is minimal for these types of injuries.

In review of the past 3 years (2010 to 2013), the average age for retirees in the fire service at NWFDF is 57 years old, with a total of 12 retirees during this time period and 4 medical retirees over the last 10 years. The cost to train one new recruit at NWFDF includes \$30,000 for the fire academy plus a class-size dependent cost per student. Based on the budget and need, the academy takes six to eight months to initiate training. From 2007 to 2013, two academies were held: one in 2010 with 12 recruits and another in 2007 with 26 recruits. The recruitment process involves a one-year probationary *passport*, during which the new

recruit receives regular wages while under supervision. The number of rovers depends on the academy, although NWFD's plan is designed to have a total of 24 rovers (6 captains, 6 paramedics, 6 engineers, and 6 firefighters). From April, 2012, to April, 2013, NWFD had five rovers with the following hourly wages and benefits: \$24.4023, \$17.7127, \$45.1290, \$23.2396, and \$18.5973. As rovers spend about 10% of their time in backfill, their total cost for backfill replacements may be estimated by multiplying these figures times one-tenth of their work hours or through a more comprehensive case-study analysis as represented in Table 5.

Other factors to consider include intangible costs, such as the effects of injuries on crew integrity and the crew members' sense of safety in the fire service. These factors are not easily monetized and are therefore not included in this analysis.

## Discussion

Discussion of findings is organized into three sections: principal findings, implications for policy and practice, and limitations of the study. Although study limitations exist, important lessons emerge from the research that can improve safety and associated cost savings in the fire service.

## Principal Findings

The results of this study indicate that overall NWFD workers compensation insurance premiums comprise approximately two-thirds of their total injury costs and that the direct costs of injury claims outweigh the indirect costs. From 2007 to 2013, NWFD lost \$750,066 on average each year due to injury claims, or \$13,890 per injury claim, including both direct and indirect costs. The direct costs (\$62,604 for wage replacements plus \$5,069 for medical bills and \$489,807 for the insurance premium) contributed 74% to the total cost of injury borne by NWFD, whereas the indirect costs (\$101,330 for backfilling plus \$91,256 for administrative/investigative/training personnel) contributed 26%.

Compared to workers compensation insurance premiums, NWFD's paid medical, indemnity, and other costs ratios averaged 1%, 13%, and 39%, respectively, totaling 53% of the insurance premium. Given that there is a 1.9 to 1 ratio of NWFD premium costs compared with the expenditures SCF reports for indemnity and medical costs for injured workers, NWFD's total costs for injured workers can be estimated by multiplying SCF expenditures by a factor of approximately 2.9. Not including the insurance premium, NWFD's average direct and indirect costs of \$260,259 (Table 6) were approximately equal to the average annual claims paid by SCF, \$257,912 (Table 2).

When analyzing modified-duty-only claims (without paid indemnity from the SCF), the study reveals that NWFD pays a significantly higher amount than SCF does, which categorizes these types of claims as *medical only*. The percentage of medical-only claims,

which include modified duty without lost time, is about 23.3% (or 14% of all injury claims). Interestingly, these types of claims accounted for 24% of the backfill costs, which amounted to an annual average of \$101,330 (2013 US dollars) from 2007 to 2013. Furthermore, half of the indemnity claims (22% of all injury claims) included modified duty and accounted for 58% of the total backfill costs.

The issue of the indirect costs of occupational injury and illness borne by industry has been explored in depth (Sun et al., 2006; Jallon, Imbeau, & Marcellis-Warin., 2011a); this situation is not the same in the fire service. One challenge in addressing that research gap is the inconsistent definition of the term *indirect costs*. The 2005 National Institute of Science and Technology report prepared by the Teradata Corporation, which estimated the national costs of firefighter injuries and prevention efforts, included backfill and administration costs and the firefighters' lost income in its definition of *direct costs*, while the *indirect costs* included insurance, PPE (personal protective equipment), and training costs (Teradata Corporation, 2005). In contrast, researchers in industrial economics tend to include only costs that are visible and easily identifiable by the firm in direct costs (insurance premiums, uninsured medical expenses) (Jallon et al., 2011a). Indirect costs typically include the administrative, backfill, and investigative costs (Sun et al., 2006), largely driven by the use of human resources that result from a workplace injury.

## Implications for Policy and Practice

Since SCF reports are more easily accessed than internal NWFD data, using SCF data was considered by NWFD to be the most straightforward method of estimating the potential cost savings of future safety and health interventions. For example, if a specific intervention would be expected to reduce back-strain injuries by 20%, then the potential economic benefit of the intervention could be calculated by multiplying the SCF-reported back-strain injury costs by 2.9 to estimate total NWFD back-strain injury costs and then by 20% to determine the amount of expected reduction in total back-strain injury costs. In discussion with NWFD management, this approach to estimating potential savings was well received and considered a valuable tool.

The results of this study can help to develop the business case for a planned safety and health intervention. For example, the majority of NWFD injury claims, including the most costly claims, are sprains and strains. Previous research in the fire service has found increased fitness is associated with a decrease in injuries (Leffer & Grizzell, 2010; Poplin, Harris, Pollock, Peate, & Burgess, 2012; Peate, Bates, Lunda, Francis, & Bellamy, 2007); therefore, a fitness training program for injury-risk prevention may be a viable strategy to help reduce long-term costs. The cost of implementation of the program is \$40,000 for the first four



months, according to the NWFD HSO. This investment could be recovered with a reduction of four back, knee, or shoulder injury indemnity claims (average SCF individual injury costs of \$4,098 to \$4,948, which, when multiplied by 2.9, would yield estimated total NWFD costs of \$11,684 to \$14,349).

## Limitations of the Study

First-aid-only injuries are not included in indirect cost estimates, which because of their frequency and the related time expenditures of Human Resources employees could add up to significant costs (Jallon et al., 2011b). The selection of case reports by NWFD used to calculate indirect-injury costs was a small convenience sample, although a variety of injury claims were included: lost-time versus no-lost time, ranging from 0 days to 40 days off regular duty. We did not attempt to estimate the cost of injuries borne by individual firefighters, taking instead the department perspective, a common practice in economic evaluations in the fire service (Leffer & Grizzell, 2010; Kim, Hayden, & Mior, 2004; Walton et al, 2003). This approach, however, fails to estimate the total or societal cost of injury (Tompa, Dolinschi, Niven, & deOliveira, 2008).

## Conclusions

According to this study of injury claims for the SCF between 2007 and 2013 and the 10 NWFD case reports from 2012 to 2013, direct costs, driven largely by the insurance premium, were greater than indirect costs to the fire service. Among the groups analyzed, subjects with sprain and strain injuries accounted for the highest proportion of costs overall to the fire service, indicating the continuous need for injury-risk prevention. Direct and indirect costs could vary between municipal and suburban fire departments and districts and geographically across the US. Further differences are anticipated between career and volunteer associations. Additional studies should be conducted among fire departments across the country, adjusting for location-dependent costs of living. However, the process of collecting and analyzing injuries and costs could follow the same methodology described in this study. A focused attempt to access more specific data in other fire departments across the country will most likely support the growing case for injury risk-prevention programs.

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## *Endnotes*

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## *An Analysis of Rules, Regulations, and Policies to Identify Opportunities and Limitations for Fire-Based EMS Systems to Integrate into Healthcare Using a Community Paramedic Model*

### *Abstract*

*The purpose of this research is to perform a legal and regulatory analysis of existing healthcare rules, regulations, and policies to identify opportunities and limitations for fire departments to expand their range of care from one predominantly focused on emergency response to becoming an integral part of the healthcare system. By identifying the opportunities and limitations provided by existing rules, regulations, and policies, fire-department leadership will be better equipped to drive decisions that are likely to improve community involvement in managing population health as a means of improving patient outcomes and patient quality of life and reducing per capita healthcare costs. It is important for fire-department leadership to understand the intricacies of healthcare legislation and policy as a means of establishing a legally sound practice that is eligible for reimbursement from payers.*

**Keywords:** *fire-based emergency medical services, community paramedic, Patient Protection and Affordable Care Act (PPACA), prehospital care, community health worker*

### *Introduction*

The Patient Protection and Affordable Care Act (PPACA) was signed into law on March 23, 2010. The passage of this law has opened the door for prehospital care to potentially expand its reach from an industry whose principle foci have been response to emergencies and interfacility transfers to becoming an integral part of the healthcare continuum. Currently, a number of innovative industry leaders have taken steps to integrate their respective agencies into functioning parts of their local or regional healthcare systems. These agencies use Emergency Medical Services (EMS) providers in a variety of ways, including treating and releasing low-acuity emergency calls in-field, as well as in-field management of patients with chronic health conditions. This novel approach to healthcare is generally referred to as the Community Paramedic Model and relies on the mobility of EMS responders to connect patients to healthcare and associated support services.

Almost overnight, the concept of Community Paramedic-Mobile Integrated Health (CP-MIH) swept through the fire industry. Fire-department leadership and providers alike began to look for a way to insert their departments into the healthcare arena as a means of adding value to their services and potentially generate revenue to offset operational costs. However, the majority of information available on how departments can integrate into healthcare is limited to media reports, the EMS industry conference circuit, position statements, and limited evidence-based research

that predominately focus on care. These sources may provide discussions regarding how risk assessment was performed to identify target patient populations, how connections are made with healthcare systems, and whether EMS providers are actually capable of managing patients. However, there is little discussion in this literature concerning whether or not this novel approach to patient care is permitted to be legally implemented in state rules, regulations, or policies or whether there is a means to integrate into healthcare while state rules and regulations are adjusted to change scope of practice. Furthermore, there has been little discussion regarding how existing rules, regulations, and policies address reimbursement to departments for the services that their proposed CP-MIH programs may provide.

As some states have noted, many of the skills and assessments that are within a state's EMS scope of practice are compatible with concepts that have been discussed within the EMS industry as being part of CP-MIH care. For example, EMS agencies are typically required to have a Clinical Laboratory Improvement Amendments (CLIA) certification in order to perform blood glucose evaluations (Clinical Laboratory Improvement Amendments [CLIA], 1988). This certification could be used to perform a variety of point-of-contact blood labs, which is an integral part of managing patients with chronic health conditions in the out-of-hospital setting. However, it has also been noted

that these skills are only to be provided in the emergency setting and possibly during interfacility transfers. As such, the limitation of the scope of practice to emergency situations prohibits many fire departments from initiating a CP-MIH program.

EMS in and of itself is a complicated operation. Departments that provide EMS transport must be cognizant of rules and regulations at the state and federal level regarding program implementation and reimbursement. Typically, federal healthcare laws that specifically impact EMS are generally isolated to reimbursement, while state healthcare laws address regulation of EMS as an industry with respect to licensure of agencies, providers, and reimbursement. Because of these factors, it is important that fire-department leadership fully understand the intricacies of legislation and policy as a means to drive change.

This study is a legislative and policy review that evaluates the opportunities and limitations of a fire department implementing a CP-MIH program. The research involved assessing existing healthcare laws and policies as a means of identifying how fire departments can integrate into healthcare in a legally sound manner and potentially generate revenue.

### *State Legislation Overview*

EMS is regulated by the states as guaranteed by the Constitution of the United States of America in the Tenth Amendment, which gives states “the power to establish and enforce laws protecting the welfare, safety, and health of the public” (Cornell University Law School, 2015, p. 1). As such, the first sources that fire-department leadership should consult in determining whether a CP-MIH program could be initiated are state laws and policies.

The EMS scope of practice for many states is isolated to the provision of care in emergency situations and interfacility transfers. Some states, such as Ohio, have identified this limitation and advised EMS providers and agencies alike that a CP-MIH program does not fall under the existing scope of practice. The Ohio Department of Public Safety (ODPS) advised providers and agencies that although there are practices and procedures in the state scope of practice that could be performed in a CP-MIH delivery model, EMS providers are isolated to the provision of these skills in the emergency setting (Ohio Department of Public Safety [ODPS], 2014). The ODPS further indicated that it was assessing the possibility of adjusting existing laws to enable interested communities to institute a CP-MIH program (ODPS, 2014).

The Virginia Office of Emergency Medical Services noted that the scope of practice for EMS is isolated to emergency situations. However, the office went on to advise any agency interested in providing CP-MIH to “contact the Division of Acute Care Services, Office of Licensure and Certification (OLC), Virginia Depart-

ment of Health (VDH), in order to determine if licensure as a home care organization is required” (Virginia Department of Health [VDH], 2014, p. 2). In this situation, fire departments wishing to implement a CP-MIH model would potentially need to become a licensed home-care agency. However, although this state-law provision may present some opportunities by potentially paving the way for fire departments to branch into some aspect of the healthcare industry, it also presents a number of limitations that may outweigh the opportunity. For example, the portion of the Virginia administrative code that addresses home-care organizations states: “Organizations shall accept a client only when the organization can adequately meet that client’s needs in the client’s place of residence” (VDH, 2006, p. 16). Because the Virginia scope of practice for EMS providers limits care provision to emergencies and interfacility transfers, fire departments would be unable to legally meet this requirement unless they employed additional care providers who operate under scopes of practice conducive to the nonemergency, out-of-hospital setting. Additionally, this requirement would also limit fire-department CP-MIH programs from providing care to medically underserved populations and other patient populations who may have significant need and/or impact on the emergency-response system, but who do not qualify for home health care.

Some states have already taken the steps necessary to allow fire departments to insert themselves into CP-MIH and thereby enter into healthcare systems. In Public Law (P.L.) 308, No. 37, Pennsylvania declared that, “It serves the public interest if the emergency medical services system provides community-based health promotion services that are integrated with the overall health care system” (Health and Safety and Vehicle Code, 2009, p. 2). The law goes on to state that the chapter “shall be liberally construed to establish and maintain an effective and efficient emergency medical services system” (Health and Safety and Vehicle Code, 2009, p. 2). This law may allow fire departments to not only implement a CP-MIH program, but also to expand such a program to include connecting patients with supplemental resources, such as housing, that are important to maintaining a healthy lifestyle.

Florida allows EMS agencies to “perform health promotion and wellness activities and blood pressure screenings in a nonemergency environment, within the scope of their training, and under the direction of a medical director” (Emergency Medical Services Community Health Care, Florida Statutes, p. 1). In this instance: “the term ‘health promotion and wellness’ refers to the provision of public health programs pertaining to the prevention of illness and injury” (Emergency Medical Services Community Health Care, Florida Statutes, p. 1). Under this Florida law, fire departments would need to work in partnership with local health departments to institute a CP-MIH program.

As has been discussed, many states have identified that EMS providers are isolated to providing care in emergency situations. In some states, CP-MIH pilot projects have been approved as a means to assess the impact on patient-management schemes and lowering per capita healthcare costs. In effect, these pilot projects circumvent the scope of practice limitation and allow for a period of evidence collection before legislative changes can be made. However, in some states the number of pilot projects has been limited to a small number of demonstrations. This limitation prohibits fire departments and other agencies from beginning such a program until the project assessment period has concluded and outcomes have been analyzed. For example, the State of California limited their pilot projects to 12 sites throughout the state (California Emergency Medical Services Authority [CA EMSA], 2015). Although these sites cover sizeable geographic areas and involve multiple agencies, it is still a small fraction of the state's prehospital care-provider population. Fire departments that do not wish to wait for pilot projects to conclude could identify other forms of patient care that could be easily integrated and still be compliant with the law. One such opportunity is discussed later in this article (see Healthcare Integration section).

Some states, as a means of controlling per capita healthcare costs, have elected to extend Medicaid coverage to a larger population. These policies are a response to options in the PPACA that allow states to expand Medicaid coverage to increase the number of insured Americans (Patient Protection and Affordable Care Act [PPACA], 2010). Some of the states that have expanded Medicaid coverage have also approved payment for treatment-no-transport of patients. This approval is a step forward from the traditional Centers for Medicare and Medicaid Services (CMS) rule that reimbursement was designated for transport and could present fire departments in those states with opportunities to become integral members in managing public health.

### *Federal Legislation Overview*

Emergency medical services are lesser considerations of the PPACA. Specifically, the PPACA refers to the abbreviation *EMS* only three times. Two of these instances are in reference to the EMS workforce as an example of a group of providers in the overarching healthcare workforce and as examples of health professionals (PPACA, 2010). The third reference is part of the larger name for the National EMS Information System or NEMSIS as industry providers have come to know it (PPACA, 2010). The phrase *emergency medical services* appears a total of eight times: two references are to the examples for the healthcare workforce and health professionals mentioned earlier, two are in reference to reauthorizing of the Emergency Medical Services for Children (EMSC) Act, and four are

in reference to improving coordination of trauma care (PPACA, 2010). Given these findings, it seems that the majority of focus on EMS in the PPACA is in regards to EMS as a function of trauma care and coordination of trauma services. In fact, the term *emergency care* is not defined in the PPACA, but the term *emergency services* is given a definition. Emergency services are defined in the PPACA and include "acute, prehospital, and trauma care" (PPACA, 2010, p. 441). Emergency care services are not defined in the PPACA, but are defined in Title 42 of the Code of Federal Regulations (CFR) as "inpatient or outpatient hospital services that are necessary to prevent death or serious impairment of health and, because of the danger of life or health, require use of the most accessible hospital available and equipped to furnish those services" (Public Health, Title 42 Code of Federal Regulations [CFR], 2015, p. 1).

Although the definition of *emergency services* includes prehospital care in the PPACA, additional explanations and definitions may exclude EMS agencies from receiving payment from insurance carriers, depending on how the specific EMS agency is identified. EMS agencies are identified as *ambulance providers or suppliers* (Centers for Medicare and Medicaid Services [CMS], 2015). A *supplier* is "any ambulance service that is not institutionally based" (CMS, 2015, p. 5), which generally is the designation of the majority of fire departments that provide ambulance transport. A *provider*, on the other hand, is an ambulance service "which is owned and/or operated by a hospital, critical access hospital, skilled nursing facility, comprehensive outpatient rehabilitation facility, home health agency, hospice program, or, for purposes of section 1814(g) and section 1835(e), a fund" (CMS, 2015, p. 5). According to the PPACA, payment for emergency services is only available to health-care providers, which therefore appears to exclude suppliers. Additionally, other portions of the PPACA regarding trauma care, isolate emergency services "with respect to an emergency medical condition" (PPACA, 2010, p. 25) to "medical screening examinations that are within the capability of the emergency department of a hospital, including ancillary services routinely available to the emergency department to evaluate such emergency medical condition" (PPACA, 2010, p. 25). This definition appears to preclude fire-based EMS care from reimbursement as a care provider since it does not provide a medical-screening examination within the emergency department, and it is not considered an ancillary service (Scope of Facility Services, 1992). As such, it could be inferred that reimbursement for actual patient care from insurance payers is isolated to the hospital. In this way, payment for fire-based EMS service is then still isolated to receiving compensation for transport to the emergency department.

As will be discussed later, there are several opportunities existing within the PPACA that could provide openings to fire departments in expanding service.

However, expanding into these opportunities may require fire departments to contract with insurance companies. In this instance, it will be important for fire departments to explore the different ways they will enter into contractual agreements and whether the provision of this service will allow them to qualify as private providers (DeMerceau, 2015). This issue will be particularly important since the PPACA has eliminated insurers from denying coverage based on preexisting conditions (PPACA, 2010). As a result, the PPACA has forced insurers to take a more proactive role in addressing their customer's medical needs to keep their costs down ("With New Health Law," 2014). This result provides an opportunity for fire departments to meet a need in their communities, but also generate revenue by capitalizing on payments from insurance carriers. However, as previously discussed, EMS providers may be limited by the scope of practice in the state which reserves EMS patient care to emergency situations. In these instances, fire departments could not enter into contracts with insurance carriers because providers would be operating out of scope and therefore breaking the law.

## *Revenue*

Based on the discussion in the previous section, it seems that fire departments will continue to be unable to generate revenue for services rendered for the provision of emergency medical care without transport; and, in effect, the PPACA has continued to hold reimbursement of prehospital care to that of a transport benefit. With the exception of state laws that have extended Medicaid payouts for treatment without transport, it would appear that fire departments are being denied a means of promoting sustainability.

It is well known that reimbursement solely for emergency transport does not fully cover the cost of operations, let alone lead to profitable outcomes (Hatley & Patterson, 2007). Additionally, some fire departments generate revenue from interfacility transports in order to generate revenue or as a result of community need. Furthermore, with CMS reducing reimbursements for certain nonemergency transports, these fire departments will be further impacted and will need to find new revenue sources to maintain profitability (CMS, 2013). With this factor in mind, it seems that it will be necessary for fire departments to increase service provision outside of the transport business and into the healthcare industry. The PPACA may potentially hold a number of opportunities for fire departments to expand service to include the provision of healthcare.

As fire departments begin to explore the opportunities that may be available because of the PPACA, it is important to note that caution should be paid to expanding service provision because it impacts revenue generation. Departments seeking to expand service provision should be sure that service provision

does not require so much expansion of personnel that it would likely minimize revenue generation. Service expansion should not be enacted in such a manner as to negatively affect the department's core responsibilities to emergency response. An inability to support established core functions or essential functions established through legislation could result in litigation regarding breach of contract and/or negligence. Although negligence on the part of the department may be difficult to prove (Shin, 2010), it does not mean that a department cannot have a suit brought against it. In both instances of litigation, for breach of contract or perceived negligence, there is a financial loss affecting revenue. As such, fire departments wishing to act on opportunities identified in the PPACA should perform a risk-to-benefit analysis before implementing a healthcare integration.

Once it has been determined that the risk is acceptable, fire departments should begin to engage alternative sources for revenue such as insurers and other provider groups that may be willing to pay for the expansion of services, provided these services are within the scope of practice. Specifically this expansion will mean that fire departments will be able to diversify their revenue generation in such a manner that it could improve sustainability.

## *Healthcare Integration*

As has been discussed, fire-based EMS as part of the EMS industry is currently limited to generating revenue for service by transport benefit. This limitation means that if a fire department is to thrive, it will need to expand and diversify its current level of care and integrate into healthcare systems. Without integration into healthcare, it is likely that fire departments will be unable to survive in the manner they exist now, especially with increased scrutiny of Medicare/Medicaid fraud and declining revenue. It is unlikely that fire-based EMS will disappear since acute medical emergencies will likely always exist. However, if the physician and nursing workforce that enhances accessibility to healthcare catches up with demand, it could potentially reduce the demand on EMS services. As such, fire departments must integrate into healthcare, or they may fall to the wayside as progress marches on.

Within the fire service's attempt to integrate into healthcare, there is the possibility for certain assessments and interventions, within the scope of practice of prehospital care providers and according to the law, that are open to reimbursement for services rendered through insurance. However, it has been noted that a typical state's scope of practice for prehospital care providers not only explains what skills providers are enabled to provide, but also under what circumstances. Many states have limited prehospital care providers to the provision of care only in emergency situations and exclude nonemergency situations. As such, it will be

important to ensure that state laws, rules, and regulations are modified to include emergency and non-emergency responses and patient management (ODPS, 2014).

A second issue that concerns the acceptance of the EMS industry, and by proxy acceptance of fire departments by the larger healthcare industry, is a lack of evidence regarding patient outcomes and assessment of the value of service by patients. The integration of EMS into healthcare will not just be isolated to providing evidence-informed care. It will also mean that EMS as a whole will need to push for quality-of-care standards to remain in line with the rest of the healthcare industry. The PPACA, by design, has inserted controls to enhance patient care by determining reimbursement based on value of service (PPACA, 2010). Currently, evaluations of value are subjective at best and rely on the patient's assessment of value (Rattray, 2009). Perhaps fire departments could improve the perception of peers in the healthcare industry by tracking patient outcomes and assessing the value of the service to the patient. This tracking could be easily accomplished in states that have expanded Medicaid coverage as a means of increasing access to insurance (PPACA, 2010). Some of these states have expanded ambulance-benefit reimbursement to include payment for treatment without transport of eligible Medicaid beneficiaries to reduce the burden of high-emergency department costs (Munjal & Carr, 2013).<sup>1</sup> In doing so, they have potentially created a situation where fire departments could follow up with patients that were treated and receive evaluations that rank the *value of care* received. Additionally, this procedure would align with the PPACA's goal to make payment decisions based on value and could improve the likelihood of future reimbursement increases from payers. By combining evaluations of value and evidence of positive patient outcomes, it will be possible for prehospital care providers to gain acceptance into the overarching healthcare industry as an essential service in patient healthcare management.

Simultaneous to overcoming these key obstacles involving scope of practice and lack of peer acceptance, fire departments should also identify other ways to integrate into healthcare. The PPACA provides grant opportunities for pilot projects that seek to improve patient management by regionalizing and enhancing "trauma service availability" (PPACA, 2010, p. 448). Response to trauma is the foundation of modern-day EMS. As such, fire departments and prehospital care providers alike should dedicate themselves to improving the perception of EMS as an integral part of trauma systems. Under the PPACA's current design, EMS is identified as a part, or consideration, for regionalization of trauma systems. However, it appears that the actual provision of care and patient management is isolated to the hospital emergency department (PPACA, 2010). With this situation in mind, fire departments that par-

ticipate in the pilot programs should do their best to influence decision makers to track and share patient outcomes. This information allows two goals to be accomplished: First, it accounts for the entire episode of care from first-provider contact to discharge from the system; and second, it allows for prehospital care providers and fire departments to make adjustments to care provision and education to continue to improve outcomes. By making the sharing of patient outcome data an integral part of the pilot project, decision makers will start to change the perception of EMS from a transport benefit to a valuable aspect of patient-care delivery for trauma systems.

Fire departments participating in pilot projects to improve trauma systems should also encourage project administrators to include prehospital care providers in the use of electronic health records (EHRs). The use of EHRs is an important part of the PPACA since EHRs reduce costs by improving quality and continuity of care (Bar-Dayyan et al., 2013). Currently, fire-based EMS is typically excluded from participation in the use of EHRs, which means medical interventions and pertinent medical findings may not be included in the EHRs. This situation could impact patient management by increasing the likelihood of medication and procedural errors due to records of previous interventions by prehospital care providers not being included in the patient-care record. These omissions could result in poor patient outcomes and increased care costs to the patient and system. If fire departments and prehospital care providers could have access to the EHRs, then more advanced care providers would have a complete record of the continuum of care, thus improving patient outcomes. Inclusion in the EHR access accomplishes two goals: First, it could improve patient outcomes; and second, if the first point is successful, it establishes a foundation for fire-based EMS to be an integral part of healthcare. This foundation is established by showing the importance of gaining patient-care information on even the smallest patient encounter as it relates to long-term health management.

Gaining access to the EHRs is critical in healthcare integration because it will allow prehospital care providers to fit into the spectrum of providing appropriate care based on pertinent medical history rather than the current practice of relying on incomplete medical histories and best guesses. Additionally, by gaining access to EHRs, fire-based prehospital care providers will be able to perform additional patient-care activities such as preventative medicine and comfort care.

The PPACA provides coverage of preventative health services that are evidence-informed and recommended by a variety of groups or agencies that have been given the authority to provide direction (PPACA, 2010). It is possible that some screenings could, and may already, be performed by fire-based prehospital care providers if they are within the scope of practice. Many of these screenings require standard patient-

assessment tools and/or are permitted by the CLIA. The opportunity for fire departments to collect revenue from these screenings can be found within existing rules and regulations that require full coverage, without cost sharing, for preventative health services. Full coverage “for items or services that have a rating of A and B in the current recommendations by the United States Preventative Services Task Force” (Coverage of Preventative Health Services, 2015, p. 1) currently qualify for reimbursement from payers. In assessing the items and services that have an A and B rating, prehospital care providers could be compensated for a variety of procedures including blood-pressure screening, cholesterol abnormalities, aspects of fall prevention in patient bases over age 65, and diabetic screening (United States Preventative Services Task Force [USPSTF], 2014).

By way of access to EHRs and the participation of fire-based prehospital care providers in managing preventive-medicine interventions, it is also possible for fire departments to become “primary care extension agencies” and deploy fire-based resources to act as “community-based health connectors” (PPACA, 2010, pp. 582, 584). Inclusion in these types of programs solidifies fire-based EMS as a functional part of public health. Prehospital care providers, whose current function is provision of emergency care accessed through the 9-1-1 system, are part of the community and could likely be the group of providers best suited to perform outreach in the low-income populations targeted by this aspect of the PPACA (PPACA, 2010). Because these communities are typically medically underserved, clinics and other providers could utilize EMS as an extension of healthcare to appropriately treat large impoverished populations. A combination of telemedicine, standing orders, and EHRs could allow for a reduction in healthcare costs and improved population health and individual outcomes (Oriol et al., 2009).

As noted previously, some states have expanded Medicaid to include a larger portion of the population and meet the demands of the PPACA. Additionally, CMS has also made adjustments to its regulation to more closely align itself with the requirements of the Social Security Act (Trust for America’s Health [TFAH] & Nemours, 2013). This adjustment allowed for states to reimburse preventative services that are not provided by a licensed practitioner or physician, but are ordered by such, as long as the services were provided under the scope of practice of the nonlicensed provider. However, as has been discussed, EMS providers in many states are limited to emergency situations for the provision of care. As such, fire departments have the option of waiting for changes in the scope of practice or identifying other ways to provide the care. Several states use a type of caregiver known as a *community health worker* (CHW) to address certain

population health needs. Following the assessment of state laws, it may be possible for fire departments to involve themselves in this type of care with minimal additional training.

Specifically designed to address medically underserved populations, CHWs should be members of the communities where they work, should be selected by their communities, should be answerable to their communities for their activities, should be supported by the health system but not necessarily be a part of its organization, and have shorter training than professional workers. (Lehmann & Sanders, 2007, p. 3)

Following this definition from the World Health Organization (WHO), it can be seen how fire departments may, in all or part, meet this definition.

The CHW model has been in use for several years and is typically used to address specific health-care needs in medically underserved communities. Research shows a notable reduction in per capita healthcare costs when a CHW model is used to mitigate target conditions. For example, in King County, Washington, a CHW program aided in the reduction of asthma triggers in homes (Krieger, Takaro, Song, & Weaver, 2005). CHWs “reduced asthma symptom days and urgent health services use while improving caregiver quality-of-life scores.” (Krieger et al., 2005, p. 4).

Sixteen states support training and certification standards for CHWs, and several of the standards in these states either mirror prehospital care or would allow for supplemental training that would enhance its delivery. However, some of these states have specific conditions of focus, while others have a general focus on public health. For example, the State of Ohio allows CHWs to be certified with services operated under the supervision of a registered nurse. This practice addresses community healthcare needs using a flexible focus on multiple aspects of health (Carter & Saffore, 2014). Fire departments that operate in states with flexible CHW legislation, such as those found in Ohio, could easily integrate into healthcare by sending select fire-based EMS providers to gain the appropriate training and partnering with public health agencies. Unlike the Virginia requirement to become a home-care organization, which would likely result in hiring different and more costly care providers, a CHW program can be easily implemented using existing EMS providers and minimally contracting with a registered nurse. This approach would allow fire departments to legally implement a CP-MIH program as long as nonemergency patients are being addressed under the scope of a CHW as allowable under the state’s laws.



## Conclusion

In conclusion, fire departments that want to implement a legally sound CP-MIH program must use existing healthcare legislation and policy to drive the decisions to create a program. Fire departments implementing a CP-MIH program must assess the laws within their individual states to ascertain whether this style of care is permitted under the existing EMS scope of practice or whether legislative change is required. If the EMS scope of practice is limited to emergency care, fire department leadership should consider identifying other means to enter into the healthcare industry that are easily integrated into existing services without substantially increasing the department's operating costs.

Some aspects of reimbursement from the federal government are likely to be determined not only by the PPACA but also whether or not the provision of care is within the scope of practice of the agency or practitioner providing the care. As such, fire departments need to determine what type of care they are legally able to provide under state law.

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### *Endnote*

<sup>1</sup> Minnesota and Michigan are examples of states that have expanded Medicaid programs and included reimbursement for treatment with no transport.

### *Acknowledgment*

I would like to thank Dr. Attila J. Hertelendy, Director of the Emergency Health Services Program and Assistant Professor at George Washington University, for his help and assistance in preparing this article.

### *About the Author*

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*Review of:*

Clark, B. A. (2015). *I can't save you but I'll die trying*. Nashville, TN: Premium Press America. 305 pages (\$29.95). ISBN 978-1-887654-57-9

Burt Clark is a troublemaker and a maverick. Furthermore, he is a bane to those enamored with the stereotypical hard-drinking and smoking firefighter portrayed in the past by such movies as *Backdraft* and *Ladder 49* and to a profession where the highest form of honor is a line-of-duty (LODD) death with full military honors. No, Dr. Clark is not one of this ilk. Rather, he, as exemplified throughout his long tenured career in the fire service and as faculty at the National Fire Academy, is one who has and continues to reexamine the long established culture of the fire service, with a passion for making it safer, more efficient, and more professional.

Dr. Clark's monograph is a collection of essays and articles, published over the course of almost 40 years in the fire service. During this time, he questioned such relevant issues as LODDs, advocated for seatbelt use in fire apparatus, and became a champion for the calling of *Mayday* (call for help) among firefighters. His writing is an *in-your-face* approach to critical issues in the fire service with respect to safety, performance, and even to the very roots of the fire-fighting culture. His writings challenge the heart of the fire-fighting profession, both volunteer and career; and his words should not be taken lightly or brushed off for the fear of injuring one's feelings. Such is the aim of someone who has the foresight to propose, nay demand, a reevaluation of our noble profession.

Clark asks why firefighters die and even challenges the classification that their deaths are considered LODDs (or its equivalent, KIA — killed in action). Rather, he proposes using the Wikipedia term "occupational fatality"<sup>1</sup> as an "indication that something went wrong" (p. 55). If not a scholarly choice for a source, nevertheless, the phrase poses a query that penetrates to the core of the fire service. Terminology notwithstanding, Clark challenges the idea that dying is part of the profession.

This approach runs counter to what past (and present) fire-service personnel are ingrained to believe when entering the profession — firefighters go to work, and some do not always come home. Moreover, he contends that we, in the profession, know the answer, but may lack the "collective courage" (p. 62) to make this a reality. Such opinion is seldom heard, one would guess, at the firehouse coffee table.

Beyond the LODD argument, the author examines two critical but often overlooked issues relative to firefighter safety: wearing seatbelts and calling *Mayday*. Clark has long been the leading advocate for fire

personnel wearing seatbelts, and his creed is founded upon no new research, rather the obvious — seatbelts save lives. His advice comes with a simple order: "Put on your seatbelt" (p. 88). The irony, as Clark sees it, is the fact that we in the fire service, who are dedicated to saving lives, do not always, let us say, practice what we preach. The greater question here is what can be said about the fire service when we must be told to practice safety?

The author takes a somewhat different approach when calling *Mayday*. Although not as commonplace as seatbelt use with regards to existing fire department standard operating procedures, Clark noted back in 2001 that NFPA® 1001, *Standards for Fire Fighter Professional Qualifications* (1997), did not even mention the term. Over a decade later, NFPA® 1500, *Standard on Fire Department Occupational Safety*, has come to address the issue. In fact, the standard's nomenclature included *Mayday* directly because of Clark's efforts. As a side note, there were those from the NFPA® who actually expressed concern over the use of the term, arguing that it might have jeopardized the safety of military pilots should other agencies overhear the term in the case of a firefighter emergency. Due largely to Clark's communication with Rear Admiral Ken Venuto, United States Coast Guard, Chairman of the National Search and Rescue Committee, the potential problem of radio communication was addressed with the simple determination that fire-department radio frequencies are not the same as those used by the military. The logical was simply made obvious, thanks to Clark.

The larger issue, as the author points out, is the *stigma* (his word) associated with requesting a *Mayday*, the failure of which could result in a firefighter death or injury. This begets the author's most serious and revealing view of the fire service. In the author's own words:

There is little or no accountability, responsibility, or discipline for firefighter death or injury from the fire service, elected officials, or government agencies. There are no consequences for safety misconduct. Because, we have convinced others and ourselves that firefighter death and injury is just part of the job. (p. 31)

Harsh and incriminating words from the pen of a 40-year veteran of the fire service.

Firefighter deaths are part of the job, so many would say. What raises Clark's ire is the predisposition for fire personnel to accept this belief. This, in large part, comes from the organizational culture of the fire service, the topic of Dr. Clark's latest research.

The phrase *organizational culture* stems from the work of former Massachusetts Institute of Technology

professor, Edgar Schein, who explained the term as a pattern of shared assumptions, learned by a group. Clark's translation is simply, "Why we do what we do" (p. 38). So what does this all mean to the fire service? We must make a serious effort to change our behavior, especially considering the fact that "not following the rules is part of our fire culture," and worse, that "society gives us permission not to follow the rules" (p. 45). According to Clark, words that define a firefighter's organization culture are *go fast, close calls, wet, take risks, injury, and death*. These beliefs about his or her job have been passed down by firefighters from generation to generation and continue to drive occupational behavior. This culture is the core of Clark's research and a disturbing one at that. Furthermore, such culture, Clark contends, cannot be changed all at once, rather behaviors can only be changed one at a time.

Years ago, this reviewer came upon a now much-referenced quote from an article written by the Chief of the London Fire Brigade, Eyre Shaw,<sup>2</sup> on a visit to the United States in the latter part of the nineteenth century. His words, uttered well over a century ago, foresaw grim consequences for the fire service if its members were not adequately prepared for the profession. Experience was not enough to guide performance. Instead, Shaw called for a *professional knowledge* for the country's fire personnel. It is ironic that almost 150 years later Burton Clark is echoing the same cry under the umbrella of leadership.

The fire profession is lacking the proper direction. Some firefighters remain mired in the archaic *we always do it that way* shibboleth of consensus and

experience, despite the efforts of those who think outside of the proverbial box. Clark's monograph demands a reevaluation of our profession, what we do, how we act, and most important of all, how we think. As this reviewer wrote previously, Clark is a troublemaker. He challenges us in his words to "see the light and be the light" (p. 303). It is our absolute responsibility to provide such illumination and it begins with reading his book.

**Dr. J. M. Moschella**  
Anna Maria College

### *Endnotes*

<sup>1</sup> For a better treatment of this term, see Bureau of Labor Statistics, *Census of Fatal Occupational Injuries (CFOI)*, for the Government's definitions of illnesses, injuries, and fatalities. Of note, "Heart attacks and strokes are considered illnesses and therefore excluded from CFOI unless a traumatic injury contributed to the death." Retrieved from <http://www.bls.gov/iif/oshcfdef.htm>. On the other hand, legislation, signed by President George W. Bush in 2003 classifies a heart attack as a LODD if the firefighter was on duty engaged in strenuous work or within 24 hours of such activity.

<sup>2</sup> Shaw, E. M. (1873). Records of the late London fire-engine establishment. *North American Review*, CCXL, 108–11.

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