

Running head: RED LIGHTS AND SIREN USE RESPONDING TO EMS CALLS

Executive Development

An Analysis of Red Lights and Siren Use

Responding to Emergency Medical Services Incidents

Donald M. Waldron

Londonderry Fire Department, Londonderry, New Hampshire

September 2008

Certification Statement

I hereby certify that this paper constitutes my own product, that where language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed:

---

### Abstract

The problem was that the Londonderry Fire Department responded to all emergency medical services (EMS) calls utilizing red lights and siren (RLS) regardless of the nature of the call. This exposed employees and the public to a greater risk of being involved in a collision involving an ambulance. The purpose of this action research was to devise a method for the Londonderry Fire Department to reduce the number of RLS responses to EMS calls without adversely affecting patient outcome. This research explored several key areas including: how other departments to determined response modes; the risks were associated with RLS use; impact on patient outcome and response times; and legal and cultural concerns.

This research was carried out by performing a literature review, conducting a state-wide and internal surveys; analyzing data from the Londonderry Fire Department's computer aided dispatch and electronic patient care reporting systems, performing time comparison studies, and reviewing hospital charts. The results indicated that the use of RLS presented additional risk; that many departments utilize some form of emergency medical dispatching to determine response modes for ambulances; these prioritizations are generally accurate; and study patients coded as a more severe (delta) received more EMS procedures than patients coded as less severe (alpha). Results also found that although there were no legal hurdles to implement triaged response modes there were significant cultural hurdles to overcome.

Recommendations were made to the Londonderry Fire Department to implement a procedure of utilizing call determinant coding information provided by New Hampshire E-911. This information would allow the Department to be more selective on which EMS calls require the use of RLS when responding.

Table of Contents

Certification Statement..... 2

Abstract..... 3

Introduction..... 6

Background and Significance..... 6

Literature Review..... 10

Procedures..... 21

Definition of Terms..... 26

Results..... 27

    Table 1: A comparison of hot and cold response time..... 31

    Table 2: A comparison of alpha and delta calls at Londonderry Fire Department.. 39

    Table 3: Provider impressions and call disposition..... 41

    Table 4: EMS and ED patient care events for call number 200800939..... 45

    Table 5: EMS and ED patient care events for call number 200801059..... 46

    Table 6: EMS and ED patient care events for call number 200801092..... 47

    Table 7: EMS and ED patient care events for call number 200801150..... 48

Discussion..... 54

Recommendations..... 57

References..... 59

Appendices

Appendix A – Londonderry Fire Department EMS Statistics FY2007..... 63

Appendix B – Londonderry Fire Department EMS Statistics FY2008..... 64

Appendix C – New Hampshire Licensed EMS Units..... 65

Appendix D – New Hampshire Call Determinant Survey..... 71

Appendix E – New Hampshire Call Determinant Survey Results..... 72

Appendix F – Employee Call Determinant Survey..... 73

Appendix G – Employee Call Determinant Survey Results..... 74

Appendix H – Dispatch and Response Guidelines for Responding to 40 Buttrick Road.. 75

Appendix I – A Comparison of Londonderry Fire Department Alpha and Delta Calls.... 76

Appendix J – Derry Fire Department – Dispatch Procedures # D6009..... 77

Appendix K – Derry Fire Department – Dispatch Procedures # D6044..... 79

Appendix L – Derry Fire Department Standard Operating Guideline 902.01..... 82

Appendix M – NH E-911 August 2008 Quality Improvement Report..... 84

Appendix N – Londonderry Fire Department Proposed EMS Response Guideline..... 85

## Introduction

The use of red lights and sirens (RLS) while responding to ambulance calls has long been an accepted practice by emergency medical service (EMS) providers. The use of RLS increases the chance of an ambulance being involved in a motor vehicle collision enroute to the initial incident. The problem is that the Londonderry Fire Department puts employees and the public at risk by responding to nearly all EMS incidents with red lights and sirens.

The purpose of this research is to devise a method for the Londonderry Fire Department to reduce the number of RLS responses to EMS incidents without adversely affecting patient. This research paper will conduct action based research to answer the questions: What risks are associated with responding to all incidents with RLS? What EMS response mode policies or procedures are currently utilized by the Londonderry Fire Department? How much actual delay would result from a downgraded response to certain EMS incidents? How do other EMS agencies respond to EMS incidents? How do other EMS agencies determine response modes? What industry accepted standards exist for triaging ambulance response modes? What legal issues are associated with triaging response modes to EMS incidents? What the impact on pre-hospital care would be for downgraded response incidents? What emergency department care might be delayed for incidents that could be responded to on a downgraded response mode? What cultural or organizational issues may impede implementing a triaged response mode to EMS incidents?

## Background and Significance

The Londonderry Fire Department is a small combination municipal Fire Department that provides fire protection, prevention, rescue, dispatch, and advanced life support emergency medical services, including ambulance transport, for Londonderry, New Hampshire. The town is approximately 44 square miles and is home to nearly 25,000 people. The Town is also home to numerous industrial and commercial occupancies, a major regional airport serving approximately four million passengers per year, a stand-alone Urgent Care Center projected to serve over 12,000 patients per year, and six miles of divided interstate highway.

The Londonderry Fire Department has 48 employees and 12 call firefighters, operating out of three stations, staffing four companies. These companies consist of two engines (one in the north district and one in the south district), one ambulance, and one centrally located “tactical” company which is responsible to take the rescue truck, aerial, engine or second ambulance depending on the call.

Station assignments for employees are based on seniority. This practice results in the junior, less experienced firefighters being assigned to “Central Station”, where the ambulances are housed. As a result, the less experienced firefighters are frequently responsible for driving the ambulances.

One of the major issues facing the Londonderry Fire Department is the increase in EMS related call volume. In the past few years there have been dramatic increases in EMS responses to healthcare facilities, most notably due to the opening of a nine bed Urgent Care Center, as well as, increased responses to industrial facilities and the Manchester-Boston Regional Airport. The Londonderry Fire Department responded to 1,823 EMS calls in fiscal year (FY) 2007

(Appendix A). The Department responded to 1,967 EMS incidents in FY 2008 (Appendix B), this represents a 7.9% increase in EMS responses.

This continued increase in call volume is magnifying the risk presented by indiscriminate RLS response. The Department's standard response for most medical calls is one engine company and an ambulance, both responding in an emergent mode utilizing red lights and siren. The Department responded to 1,967 EMS incidents in FY 2008 (Appendix B), this represents a 7.9% increase in EMS responses. . Due to the fact that the majority of our responses are EMS related, and over 96% of all EMS responses utilize lights and sirens (Appendix A, Appendix B) this specific research will be of extreme value to the Department.

Another major concern of the Department is risk management for the public as well as the employees. Recently the Department has instituted a policy requiring ANSI Class 2 reflective safety vests for roadway operations, and installed defibrillator mounting brackets and "Medic Saver" safety restraint nets in all of the ambulances. Emergency driving has been identified as another area within the Londonderry Fire Department that may provide an opportunity to reduce the risk to the employees and the public while reducing the Department's risk exposure. Recently the Department implemented a policy that only the first due company responds to fire alarm activations utilizing RLS.

There have been numerous cases of ambulance accidents covered by media outlets throughout the county which has brought this issue to the forefront. These accidents are a contributing factor causing EMS personnel in the United States to have an estimated fatality rate of 12.7 per 100,000 workers, which is more than double the national average (Maguire, Hunting, Smith, and Levick, 2002).



In New Hampshire all calls placed to 9-1-1 are answered by a single state agency, the New Hampshire Department of Safety's Bureau of Emergency Communications (E-911). All requests for medical assistance are screened using an established call triaging system and call determinants are assigned to the call. The call and all information are then forwarded to the local agency responsible for dispatching responders. This is accomplished by using a dedicated computer that displays data from the E-911 and a telephone call from E-911 verbally confirms receipt of the information and allows our dispatcher to listen in or interact with the caller. Currently the Londonderry Fire Department receives, but does not utilize the call determinant information. All EMS responses include an engine and an ambulance, both responding in an emergent mode utilizing red lights and sirens with few exceptions. E-911 utilizes the Medical Priority Dispatching System protocols, all of which have been reviewed and approved by the New Hampshire Medical Control Board.

This applied research project will examine and challenge one of the historically accepted premises of EMS: that seconds count on all calls. This analysis relates directly to the terminal objective in the Executive Development course, Unit 7: Organization culture and change which states, "Recognize that the Executive Fire Officer (EFO) should be an agent of cultural organizational change" (U.S. Department of Homeland Security 2006, p. SM 7-1). Further, the concept of "everyone goes home" has become a primary concern of the fire service recently. By reducing the use of RLS to create a safer work environment for firefighters this applied research project also relates to objective "To respond appropriately in a timely manner to emerging issues", which is one of the United States Fire Administration's operational objectives (U.S. Department of Homeland Security, 2007).

### Literature Review

Historically EMS response evolved from the public safety response model utilized by Fire Departments and Police Departments throughout the country. This frequently utilized the “maximal response” concept of sending all needed assets as quickly as possible, usually utilizing emergency lights and sirens (Clawson, 1991) and driving as fast as possible without regarding for the clinical needs of the patient.

Garrison (2002) discusses how the culture of emergency workers has essentially allowed them to accept a “rescue first, my safety later” attitude. Garrison identifies that “avoiding danger is counterintuitive to rescuers” and challenges public safety leaders to make sure we are taking all steps possible to assure not only the safety of our patients, but the safety of our employees.

While asking why so many ambulance operators become involved in accidents themselves, George, Quattrone M.S. and Quattrone J.D. (1991) ponder “Maybe it is the fact that running “RLS” (red-lights-and-siren) is such an intoxicating experience that it blurs the normal judgment process which would ordinarily guide the emergency vehicle driver when driving “cold” (non-emergency status) as opposed to running “hot” (emergency status)”.

Clawson (2002) states that the rate of emergency vehicle collisions is an “epidemic”. Clawson continues to describe the cultural resistance to the concept of utilizing more cold responses and suggests that part of the problem may be within the public safety community itself. Clawson equates the “patient care” and “we save lives” rationalization of our RLS responses to “spurts of ink from a frightened octopus”. Clawson continues that “The concept of

reducing lights-and-siren use is just slightly more popular in our nation's fire service and ambulance services than gun control is with the National Rifle Association.”

An article in a nation newspaper about ambulance collisions (Davis, 2002) includes excerpts from an interview with Scott Springstead who was Operations Supervisor for Sunstar EMS in Pinellas County Florida. Springstead is quoted as saying “Our workforce is largely male, and we all drive with a little testosterone when we shouldn't. There was a little bit of bravado, a little bit of EMT and a little bit race-car driver. That's a bad attitude to take in an ambulance with you.”

Ludwig (2004) points out that there are no federal or state laws requiring an EMS service to achieve a specific response time. Ludwig writes that one of the key standards of the Fire Service, National Fire Protection Association's Standard 1710 which deals with the organization of a career fire department, stipulates a turnout time of one minute, four minutes for the response of first responders and eight minutes for the response of advanced life support personnel for “all EMS calls”. This would seem to be a rather blanket statement, and would seem to push some Departments to abandon cold responses in order to achieve NFPA 1710 compliance.

A study from England was conducted after service managers put an emphasis on responding to emergency calls within 8 minutes. In this study Price (2006) conducted in depth interviews with 20 experienced paramedics with an average length of service of 19 years. During these interviews the paramedics argued that although response time objectives “dominate” the ambulance culture they are a poor quality indicator and are easily manipulated. Price concludes that the eight minute response time goal is putting crews and patients at risk and that the objective is “not evidence based”.

Having identified that there is no legal requirement for RLS use and that response time requirements are not evidence based, we next look at the risks of RLS. According to Clawson (2002), “The incidence of emergency-vehicle collisions is not just a “problem” or even a “dilemma.” it is a public health epidemic.” Levick (2006) asks if ground EMS accidents are recurring in nature and concludes that based on the numerous papers published on the issue that the incidence of red lights and siren use and intersection accidents are “clearly recurring predictable events”. Levick continues that this issue is largely ignored and although there are far fewer events, and far fewer deaths associated with air-medical transportation accidents those events are much more thoroughly scrutinized than the numerous ground-medical transportation accidents. Clawson (1991) states that as many as 12,000 accidents occur each year in the United States involving ambulances. He also reminds us that many times “wake effect” accidents, those caused by the traffic flow disruption caused by the emergency vehicle, are not considered and may be as high as 75,000 accidents per year.

According to the Centers for Disease Control and Prevention (2003) there is no “complete” register of ambulance crashes in the United States. The CDC utilized accident databases of fatal accidents maintained by the National Highway Traffic Safety Administration to analyze accidents involving ambulances that occurred between 1991-2002. The CDC concluded that during this time period there were 300 fatal ambulance accidents involving a total of 816 ambulance occupants, 82 of which died. These accidents resulted in the death of 275 people who were either occupants of other vehicles or pedestrians. This study also found that the injury rate for EMS personnel in the United States is 12.7 per 100,000 workers, “more than twice the national average.” A major contributing factor to EMS worker death was being located in the

patient compartment at the time of the accident. It should be noted that the study conducted by the CDC included all accidents involving ambulances, not just while responding to calls.

Consideration should also be given to the financial impact of settlements and insurance premiums associated with at fault ambulance crashes as is pointed out by Clawson (2002). “This expenditure often eclipses, by several magnitudes, the negligence and public-safety “malpractice” negligence awards in dollars lost” according to Clawson.

Presented with the knowledge of the dangers of RLS response we must examine if there are tools available to reduce the incidence of RLS use. The first documented utilization of “medical dispatch”, which is to provide instructions to the caller, was in Phoenix, Arizona in 1975 when a paramedic who happened to be in dispatch when a call came in assisted by giving instructions to the caller (Zachariah, 1995). Based on the positive outcome of this call the Chief of the Department, Allen Brunachini adopted the concept and advised dispatch to continue providing prearrival instructions.

In 1976 Dr. Jeff Clawson began developing a set of established protocols and questions. These were developed with the concept that from a medical standpoint, most people requesting an ambulance are not having a life-threatening event and that the care rendered on-scene does not have any significant impact on the patient’s outcome. (Clawson, 1991). These questions and protocols were to be used by personnel answering the phone call requesting an ambulance in order to “send the right thing to the right person at the right time” (Clawson, 1991). These protocols were known as Medical Priority Dispatch System (MPDS) and were adopted by the Salt Lake City Fire Department in 1978 (Zachariah, 1995). MPDS is presently being used by

numerous Public Safety Answering Points (PSAP) throughout the country, including New Hampshire's centralized PSAP covering all 911 calls in the State (Marion, 2001).

The "right time" concept in MPDS includes sending an ambulance to certain calls in a "cold" or non-emergency response mode. Clawson (1991) claims that to his knowledge "not a single article has been published in this century that proves or even strongly indicates the use of RLS saves lives."

In order for an agency to be able to confidently implement a policy of cold response to lower acuity patients we must look at accuracy of the EMD process. We must also look at how much time is saved by responding hot.

Hinchey, Meyers, Zalkin, Lewis and Garner (2007) writes about the results of a retrospective study of 2,121 calls triaged as the least serious (alpha) from a large urban/suburban EMS system. The EMS system analyzed utilized Medical Priority Dispatch System to triage the severity of call. This study reveals that less than 1% of the alpha calls (21) were undertriaged and should have been considered a higher priority. Hinchey et al. concluded that MPDS protocols are accurate in identifying alpha calls 99% of the time.

Research conducted by Reilly (2006) scrutinized the accuracy of the Medical Priority Dispatch System in identifying cardiac emergencies. This research analyzed 56 patients who were triaged as cardiac emergencies by the Medical Priority Dispatch System in 2001-2002. Of these 56 patients, 40 were diagnosed by the Emergency Department as having non-cardiac problems. The study concludes that the Medical Priority Dispatch System *over* triaged patients 71.4% of the time. While this was seen as a waste of advanced life support ambulance resources in the context Reilly's research, it should be seen as an indication that the Medical Priority

Dispatch System tends to err on the side of caution (71% in cardiac emergencies) and not miss serious calls (1%).

It should be noted that some recent studies have shown some less favorable results from the Medical Priority Dispatch System. Feldman, Verbeek, Lyons, Chad, Craig and Schwartz (2006) analyzed the use of Medical Priority Dispatch System (MPDS) in a Canadian EMS system. The research included review of 102,582 EMS calls and compared them to the MPDS protocol utilized. While the research showed that some MPDS protocols were very accurate in identifying serious conditions (such as breathing problems and cardiac arrest), the research also showed that half (16) of the protocols “performed no better than chance alone as identifying high-acuity patients.”

However, we must ask ourselves, is responding “cold” a violation of any laws, expected levels of service or standards for EMS? To answer this we start with Allen (1991) who states that in 1982 the U.S. Department of Transportation (DOT) responding to an increase in interest in MPDS developed an emergency medical dispatching curriculum utilizing the Salt Lake City work that Dr. Clawson had already completed. Although the DOT version of the EMD protocols was considered a “lateral mutation” of Clawson’s work (Allen) this attempt did signal that EMD/call prioritization was recognized and accepted by the agency that oversees EMS at the Federal level (DOT).

In 1989, the National Association of EMS Physicians released a position paper on the topic of Emergency Medical Dispatching (Clawson, 1989). This paper established that medical dispatching is an integral part of the EMS system and is of primary concern to Medical Directors. This paper also explained that dispatch prioritizing needs to be part of any medical

dispatching program as well, and also that it is appropriate to determine the type of response based on urgency.

According to a *Dispatch Monthly* article (EMD Resources, 2007) emergency medical dispatch standards are available from National Highway Transportation Safety Administration, California EMS Authority, and the American Society for Testing Materials (ASTM). ASTM standards are intended to be able to be adopted as industry standards. Currently there are three medical dispatching standards covering EMD management, practice for EMD, and instructor and dispatcher qualification. In 1998 The National Academy of Emergency Medical Dispatch (NAEMD) was formed (EMD Resources, 2007). The NAEMD is responsible for “consideration, research, and adoption (or rejection) of proposed revisions to the Medical Priority Dispatch System protocols (What is ProQA, n.d.).

There are a variety of medical criteria dispatch systems available commercially. The system with the most research and support according to Allen (1991) is the Medical Priority Dispatch System (MPDS) developed by Dr. Jeff Clawson and now sold under the umbrella of Dr. Clawson’s company Medical Priority Consultants. The MPDS uses the more commonly known ProQA software to interface with the medical dispatcher (What is ProQA, n.d.). Other medical criteria protocol systems include offerings from PowerPhone and the Association of Public-Safety Communication Officials (APCO) (EMD Resources, 2007). Additionally King County, Washington developed and sells their own emergency medical dispatch protocols referred to as Criteria Based Dispatch or CBD (Culley, Eisenberg, Horton, and Koontz, 1993).

Harwood et al. asks the question “is it a violation of generally accepted standards *not* to respond to all 9-1-1 calls in an emergency mode?” To answer this question the author refers to



the 1994 National Association of EMS Physicians position paper (Clawson, 1994) cited above, clearly dispelling the myth that there is a standard of emergency response mode to be utilized for all 9-1-1 calls.

There have been a number of legal liability concerns surrounding the medical priority/EMD concept. For the purposes of this paper we will focus on liability associated with improperly triaged calls and inappropriate emergency vehicle responses.

In the 1989 position paper on Emergency Medical Dispatching by the National Association of EMS Physicians (Clawson, 1989) establishes that dispatch prioritizing is an established function of the EMD process. Clawson (1994) writes that the National Association of EMS Physicians has established a position paper covering the use of warning lights during ambulance response and transport. This paper takes a clear position that “the use of warning lights and siren during an emergency response to the scene and during transport should be based on standardized protocols that take into account situational and patient problem assessments.”

Harwood, Shelper and Gunderson (1995) write that the hot response mode presents a great risk exposure to the responding agency. Harwood et al. (1995) recognizes that there is inherent risk to the public and the responder associated with an emergency response and suggests that this risk needs to be weighed against the risk potential to the patient by not responding hot.

In 1995 Wolfberg writes his research has revealed that at one of the largest ambulance service insurers, Glatfelter Insurance Group, ambulance crashes while running hot through red traffic signals represents one of the greatest areas of payout. Wolfberg (1995) continues that for volunteer agencies there is a 25:1 ratio of crash claims to malpractice claims, and for commercial agencies it is a 7:1 ratio.

According to Harwood et al. (1995) in Florida after an 18 month old girl was found unresponsive in a pool by her 13 year old sister who called 911 and was not given any prearrival instructions the mother sued the responding city for not meeting the level of public expectation. This mother eventually went on to form the group Parents Against Negligent Dispatch Agencies (PANDA).

In Florida a widow filed suit in Leon Circuit Civil Court for \$15,000 in damages citing that an ambulance took 30 minutes to respond when her husband suffered heat stroke in 2003 (Rosica, 2008). In this case the call was determined to not be life-threatening and the ambulance was sent without lights and sirens. What is not known from this article is if any type of emergency medical dispatch protocols were utilized to make the non-life threatening determination.

A review of how other agencies determine response modes and respond to emergency medical calls starts with one of the more comprehensive reviews of larger EMS systems in the United States, the JEMS 2003 200 City Survey (Monosky, 2004). The 2003 Survey was utilized for this research as it included specific data on response determination. In this survey Monosky identifies that only 30% of responding agencies prioritize all EMS calls as hot. Monosky continues that 35% of responding agencies utilize a hot/cold response and 35% utilize “ALS/BLS *and* hot or cold” to prioritize ambulance responses. Monosky concludes that “no clear preference” existed for triage methods. However, it can be deducted that the practice of assigning hot responses to *all* EMS calls is clearly not favored.

Clawson (2002) writes that Salt Lake City Fire Department has been responding cold to all bravo call determinants for four years “with nary a problem or complaint.” Clawson continues

that when Salt Lake City Fire Department first implemented the Medical Priority Dispatch System the agency realized a 78% reduction in emergency medical vehicle collisions. It should be noted that in the Salt Lake City example that utilization of Medical Priority Dispatch System also reduced the number of responding units by 50% which undoubtedly contributed to the reduction in collisions.

Ludwig (2002) tells us that the City of St. Louis Fire Department instituted an “on-the-quiet” policy of a no lights and sirens response to calls that did not involve property or life risks. This policy was implemented after the Department suffered three apparatus accidents in one day. A one year analysis of this program revealed a 62% reduction in accidents and an 81% reduction in injuries.

According to an article in a emergency services trade journal about best practices, New Britain (Connecticut) EMS instituted a program in 1998 to reduce hot transports. In 2002 this initiative was expanded to utilize priority dispatching to reduce the number of hot responses as well (New Britain EMS Saves Lives, 2008). According to New Britain EMS CEO Bruce Baxter, 44.2% of their EMS calls are dispatched as a cold response with “no negative clinical impact”. Analysis also showed that the service maintained a fractile response time of less than 12 minutes to 90% of the responses, and that running hot only saved 1 minute and 45 seconds for responses in the city. Baxter points out that he has realized significant financial reduction of unscheduled maintenance on his ambulance fleet since implementing these policies as well.

Next we look at the City of Los Angeles Fire Department where according to Clawson (1991) Medical Priority Dispatch System based tiered response was implemented in March 1990. After implementing the new dispatch protocols 29% of the systems annual 250,000 calls were

dispatched as “cold”. Clawson states “I have been working with Los Angeles for more than two years, and to my knowledge, the city has never received a formal citizen complaint regarding this mode of response.”

Several studies have looked at the actual time saved by responding hot to EMS calls. Ho and Casey (1998) performed a study in which an ambulance responding hot was followed by a chase vehicle responding cold to the same emergency scene in an urban environment. An analysis of 64 runs showed an average of 38.5% (3.02 minutes) time savings utilizing red lights and sirens to respond. A similar study by Ho and Lindquist (2001) analyzed time savings in a rural environment and found time savings of 30.9% by running hot on the sixty seven runs analyzed. The time savings was an average of 3.63 minutes per call. These two studies (utilizing a chase car to follow the ambulance) may have artificially higher time savings due to delays that the chase car may have experienced due to disrupted traffic patterns caused by the initial hot ambulance response.

Another time study conducted by Brown, Whitney, Hunt, Addario, and Hogue (2000) utilized an off-duty paramedic to drive an identical ambulance through the same route at the same time of day as the ambulance response time being analyzed. This study found an average time savings of 1 minute and 46 seconds. Brown et al. point out that while “statistically significant, this time saving is likely to be clinically relevant in only a very few cases.”

This literature helps us gain an understanding that EMS responds with RLS because it always has, not necessarily because the patient needs it. There is still formidable resistance to the concept of cold responses to emergency calls even though literature clearly indicates that not only is RLS response dangerous for ambulance occupants, it is dangerous for the public. We

must ask ourselves how our response time expectation evolved, are they evidence based? We know that there is no legal or patient care standards that require indiscriminate use of RLS; in fact care standards call for the use of prioritization systems. MPDS has been in use for decades and is subject to constant review and refinements. Literature indicates that MPDS tends to be very accurate, and when incorrect MPDS generally errs on the side of caution. Finally even when RLS is utilized the time savings are minimal, perhaps less than 2 minutes.

### Procedures

The first part of this research began with the literature review initially at the National Fire Academy's Learning Resource Center in January 2008. Research included review of past Executive Fire Officer research papers as well as a card catalog search.

This literature research was continued via the internet with multiple research sessions between February and August 2008. The research was conducted utilizing the Google search engine with search terms such as: RLS, emergency response, call determinants, ambulance crashes, ambulance response, Jeff Clawson, Priority Dispatch, E-911, 911, EMS, NAOED, alpha, bravo, and hot response.

The purpose of this literature research was to answer the following research questions:

- What risks are associated with responding to all incidents with RLS?
- How much actual delay would result from a downgraded response to certain EMS incidents?
- How do other EMS agencies respond to EMS incidents?
- What industry accepted standards exist for triaging ambulance response modes?
- What legal issues are associated with triaging response modes to EMS incidents?

- What is the impact on pre-hospital from downgraded response to incidents?
- What cultural or organizational issues may impede implementing a triaged response mode to EMS incidents?

The second part of the research involved mailing a survey regarding EMS response policies and attitudes throughout the State of New Hampshire. 211 surveys (Appendix D) were mailed out to the EMS Unit Head of each New Hampshire licensed EMS agencies in May 2008. 49 of the agencies were determined to be non-transporting and not eligible for this survey. Of the remaining 162 surveys 125 were returned in a timely fashion and included in this research resulting in a 77% return rate. The purpose of this survey was to answer research questions:

- How do other EMS agencies respond to EMS incidents?
- How do other EMS agencies determine response modes?
- What legal issues are associated with triaging response modes to EMS incidents?
- What cultural or organizational issues may impede implementing a triaged response mode to EMS incidents?

An employee survey (Appendix F) was conducted at the Londonderry Fire Department with 50 surveys being distributed with 20 surveys being returned resulting in a 40% return rate. The purpose of the employee survey was to answer the research question:

- What cultural or organizational issues may impede implementing a triaged response mode to EMS incidents?

A review of Londonderry Fire Department EMS response policies was conducted on April 17, 2008. This review consisted of analyzing the Londonderry Fire Department Standard

Operating Guidelines and searching for any pertinent documentation located in the Londonderry Fire Department Dispatch Center. Research was also conducted utilizing report options within the Trauma and Emergency Medical Services Information System (TEMSIS) electronic patient care reporting system. This research was to answer the question:

- What EMS response mode policies or procedures are currently utilized at Londonderry Fire Department?

This researcher attended an in-service training session conducted by the Derry (New Hampshire) Fire Department at the Hampstead Road Fire Station on June 5, 2008. During this training The EMS Director of the Derry Fire Department, Chuck Hemeon conducted training on that Department's newly adopted policy of responding to alpha EMS calls as a cold response.

Next, a retrospective review of dispatch call information was conducted to identify the call determinants assigned by E-911 to every EMS call received by the Londonderry Fire Department in April and May 2008. To identify these calls, this researcher utilized the Red Alert computer aided dispatch (CAD) program utilized by the Londonderry Fire Department. Searches utilizing this software with a call type filter of "EMS" and a date range filter of April 1, 2008 – May 31, 2008 were utilized. Each of these calls was then reviewed to identify the call determinant type assigned to the call. Any calls that were known to have not been initially received by E-911 were not considered for the purposes of this research.

The next portion of research was conducted via TEMSIS (utilized by the Londonderry Fire Department for electronic patient care reporting). Using these patient care records this researcher first identified the EMS calls identified as alpha and delta calls as recorded in the Red Alert computer aided dispatch system. A chart review of each patient care record associated with

these calls was then conducted. A spreadsheet was created utilizing Microsoft Excel listing the date of the call, internal run number, incident number, location of the incident, call determinant, disposition of the call, level of care provided, primary impression of the care provider, patient status, response mode, responding time, arrival time, response time, transport mode, transport time, destination and a listing of EMS care provided. These data points were compared between alpha calls and delta calls in an attempt to determine if alpha calls do in fact tend to lower acuity and if any of the interventions provided would have been detrimental to the patient if delayed due to a downgraded response. Measures were taken to assure that identifiable patient information was protected during this research. The purpose for this research was to answer the research question:

- What is the impact on pre-hospital from downgraded response to incidents?

Each alpha triaged call that was transported to our medical resource hospital, Parkland Medical Center located in Derry, NH was reviewed to determine what interventions were provided in the Emergency Department. All alpha patient outcomes were reviewed as well. This research was conducted with the assistance of Parkland Medical Center's EMS Director, Wesley Russell. Mr. Russell accessed the patient records for each of these patients to determine what care was rendered while in the Emergency Department. The purpose of this research was to answer the following research question:

- What emergency department care might be delayed for incidents that could be responded to on a downgraded response mode?

Additional research was conducted in which a number of EMS calls were analyzed to determine how much longer a cold response would have taken. This research was conducted by



retracing the route taken by the ambulance to reach the emergency scene on another day at roughly the same time of day. The purpose of this was to answer the following research question:

- How much actual delay would result from a downgraded response to certain EMS incidents?

Finally an interview was conducted with Stephen L'Heureux who is the Medical Dispatch Quality Control Supervisor for the New Hampshire Bureau of Emergency Communications (E-911) at the Bureau headquarters in Concord, NH on September 7, 2008 lasting four hours.

Some limitations were encountered in this research. One limitation was that this researcher would have preferred to have studied more alpha calls than what was included in this paper. The limited number is due in part to the time requirements imposed on the completion of this paper. Although the Londonderry Fire Department's electronic EMS records system would allow a review of a greater time period, correlating data from the hospitals would not have been readily available for the extended time frame.

Additional limitations were encountered in that the Londonderry Fire Department switched to a new computer aided dispatch system during the study period. This research had originally intended to research material from February – April, 2008 for this paper. However, research conducted in March revealed that many of the dispatchers were not recording the call determinants in the dispatch record for medical calls. This made it impossible to identify alpha calls. The Communications Division addressed this issue with the dispatchers when they were made aware of the problem and dispatch records for April and May were more complete.

Another limitation was encountered in that the emergency department records of one patient

were not able to be located by Parkland Medical Center. This reduced the number of chart reviews available to four.

Finally, limitations were encountered during the response time comparison as there were uncontrollable traffic pattern variations including traffic lights and construction as well as uncertainty as to the exact location of where each crew radioed dispatch that they were on-scene. However, any skewing that may have unintentionally occurred should primarily reflect as more time saved by responding hot.

Definition of terms

Alpha	The least serious MPDS call determinant
ALS	Advanced Life Support
BLS	Basic Life Support
Bravo	MPDS call determinant slightly more serious than alpha
CAD	Computer Aided Dispatch
CDC	Centers for Disease Control and Prevention
Charlie	MPDS call determinant slightly more serious than bravo
Cold	To travel with the flow of traffic (no red lights and siren) to a scene or hospital
Delta	MPDS call determinant of a serious nature
Echo	Most serious MPDS call determinant

EMD	Emergency Medical Dispatch, a system of providing 911 callers prearrival instructions and utilizing caller information to determine the severity of the medical emergency.
EMS	Emergency Medical Services
Hot	Utilize red lights and siren while responding to scene or hospital
MPDS	Medical Priority Dispatch System is sold by Priority Dispatch Corp. and is utilized to determine the severity of a medical emergency.
NAEMSP	National Association of EMS Physicians, a peer group of physicians with an EMS focus.
NAOED	National Academies of Emergency Dispatch, an organization that oversees the MPDS protocols, conducts research, training and accreditation of MPDS dispatch centers.
NFPA	National Fire Protection Association, a consensus based fire related standards setting organization.
Omega	MPDS call determinant not requiring an ambulance response
PSAP	Public Safety Answering Point (a location that answers 911 calls)
RLS	Red Lights and Sirens
TEMSIS	Trauma and Emergency Medical Services Information System – A software system utilized by the State of New Hampshire to write, submit and store patient care reports electronically.

## Results

Through action research this researcher was able to locate sufficient information to answer all ten research questions. Additionally, a proposed standard operating guideline was prepared for consideration of adoption for the Londonderry Fire Department. This proposed standard operating guideline utilizes call determinants (alpha, bravo, Charlie, delta, echo) to determine how apparatus will respond to emergency medical incidents.

Research question one: What are the risks associated with responding to all EMS incidents with RLS?

Based on personal knowledge the Londonderry Fire Department has not experienced any ambulance response related collisions since it started its ambulance service on July 1, 1995. However, literature review indicates that emergency-vehicle collisions represent “a public health epidemic” (Clawson, 2002) and Levick (2006) states that not only are ambulance accidents at intersections “clearly recurring predictable events” but that this issue is largely ignored. Clawson (1991) states that there were as many as 12,000 accidents involving emergency medical vehicles per year, not including wake effect accidents which do not directly involve the ambulance but two or more other vehicles that collide as a result of the disrupted traffic patterns caused by the ambulance’s response.

The Centers for Disease Control and Prevention (2003) looked into the problem of ambulance crashes and discovered that there is no “complete” register for ambulance crashes in the nation. The CDC continues that the injury rate of EMS workers in the United States is “more than twice the national average”. The CDC was able to determine that 200 fatal ambulance crashes occurred between 1991-2002. This research showed that not only did 82 ambulance

occupants die in these crashes, but 275 people who were occupants of other vehicles or pedestrians also died. This would clearly indicate that a significant risk is borne by civilians who just by chance become victim to an ambulance crash. There are significant financial impacts from ambulance collisions as well.

Clawson (2002) found that lawsuit settlements and insurance premium expenses for ambulance services, both commercial and volunteer often far outweighed the cost of medical malpractice claims.

Literature review also shows that frequent utilization of red lights and sirens response exacts a heavy toll on the vehicles themselves. An article written about the experiences of New Britain (CT) EMS in Best Practices in Emergency Services (New Britain EMS Saves Lives, 2008) attests that the service realized a huge reduction of unscheduled maintenance after implanting a cold response policy.

Research question two: What EMS response mode policies or procedures are currently utilized at Londonderry Fire Department?

There is little in the way of written guidelines and there are no standard operating guidelines that outline how to respond to EMS calls at Londonderry Fire Department. There are also no written guidelines on when to utilize red lights and sirens when transporting patients as well. From my personal experience functioning as a field provider for the Londonderry Fire Department, this decision has been left to the senior paramedic riding on the ambulance with an expectation that all calls will be responded to with red lights and sirens unless there is a good reason not to.

With the opening of an Urgent Care Center in town in 2007 an EMS response guideline was released (Appendix H). During research this guideline was located in the Londonderry Fire Department dispatch center. This Urgent Care Center response guideline, entitled “Dispatch and Response Guidelines for Responding to 40 Buttrick Road” (Appendix H) is utilized to determine whether or not to send an engine company to accompany the ambulance and also provides ambulance response mode guidance. The document affirms that “ambulance response mode (is) at paramedic’s discretion” for patients being transported to the Emergency Department. However, this guideline continues that “ambulance responds with traffic” to any requests for transport of a patient that will be admitted directly to a long-term care bed upon arrival at the hospital. These documents represent the first and only written guidance within the Londonderry Fire Department regarding utilizing red lights and sirens responding to or transporting from EMS calls. However, implementation has had little impact on overall RLS responses as 96.54% of fiscal year ambulance responses utilized RLS (Appendix B).

It would appear that there is little internal recognition of this guideline. One question of the Londonderry Fire Department employee survey asked if the respondent was aware of any internal written policies regarding how ambulances are to respond to certain types of EMS calls. 84.2% of the respondents thought that there were no internal written policies regarding ambulance response.

Research question three: How much actual delay would result from a downgraded response to certain EMS incidents?

To answer this question original research was conducted to determine the response time differences between hot and cold response to selected calls. On September 5, 2008 between 9am

– 12pm this researcher drove a vehicle similar in size to a Londonderry Fire Department ambulance from Londonderry Fire Department Central Station to each incident location for nine alpha calls that the Londonderry Fire Department responded to between April 1 – May 31, 2008. Calls were excluded if the ambulance was cancelled enroute, if the responding ambulance did not respond from the station, or if the incident location was less than 0.5 miles from the station. This research showed that responses utilizing RLS saved an average of 1 minute and 6 seconds.

Table 1

*Hot and cold response time comparisons*

Incident #	Hot Response	Cold response	Difference	Diff. (min.)
#0818	383 seconds	498 seconds	115 seconds	1:55
#0893	323 seconds	326 seconds	3 seconds	0:03
#0917	195 seconds	256 seconds	61 seconds	1:01
#0939	384 seconds	490 seconds	106 seconds	1:46
#0996	239 seconds	275 seconds	36 seconds	0:36
#1059	272 seconds	346 seconds	74 seconds	1:14
#1092	92 seconds	96 seconds	3 seconds	00:03
#1094	526 seconds	666 seconds	140 seconds	1:20
#1123	278 seconds	329 seconds	51 seconds	0:51
AVERAGE:	299 seconds	365 seconds	66 seconds	1:06

If we turn back to the experiences of New Britain (CT) EMS as chronicled in *Best Practices in Emergency Services* (New Britain EMS Saves Lives, 2008), CEO Bruce Baxter stated that running hot only saved “1 minute and 45 seconds”. A similar time savings study by Brown et al (2000) cited a savings of 1 minute and 46 seconds by utilizing an identical ambulance driven by a paramedic to drive the same route at the same time of day as the response that they were comparing to.

Additionally, literature review reveals several research papers conducted on this topic. Ho and Casey (1998) showed a time savings of 3.02 minutes utilizing red lights and sirens responding to EMS calls in an urban environment. A later study by Ho and Lindquist (2001) looking at rural EMS responses showed a savings of 3.63 minutes. The practice of having a chase car follow the ambulance may result in limitations as the chase car may have been subject to extra delays due to traffic pattern disruptions caused by the initial ambulance response.

Research question four: How do other EMS agencies respond to EMS incidents?

A survey of New Hampshire transporting EMS agencies was conducted and asked various questions regarding call determinants. Survey question one asked “In your agency, how do ambulances respond to EMS calls received via E-911?” 77.2% of responding agencies indicated “All (or nearly all) responses utilized red light and sirens (RLS). Only 19.6% of the respondents indicated that their agency utilizes E-911 call determinants to determine ambulance response mode and 3.3% indicated “other”. Survey question three showed 77.4% of respondents indicated that the agency that dispatches their ambulance receives call determinant information from E-911. 15.1% of respondents indicated that their dispatch agency does not get call determinant information and 7.5% did not know (Appendix E).



On July 1, 2008 the Derry Fire Department initiated a cold response for alpha calls policy. This policy implementation included conducting in-service training for all personnel, two new dispatch procedures (Appendix J, Appendix K) and a new standard operating guideline for 911 calls/EMD feedback requests (Appendix L). On June 5, 2008 this researcher attended an in-service training session held for Department employees on this new policy. During a follow-up conversation about cold responses for alpha calls Charles Hemeon, the EMS Director for Derry Fire Department (personal communication, September 8, 2008) stated that “The EMS Director and CQI Committee have been reviewing call determinants sent to Derry Fire Alarm from E911. We are pleased with the information and selected determinant provided from E911. Call determinants have been accurate and appropriate. Keeping safety in mind first and foremost for our EMS providers and citizens this was the right thing to do for our community.” Hemeon states that the Derry Fire Department was utilized a cold response on 11.3% of their EMS calls between July 1, 2008 – September 9, 2008 (personal communication, September 9, 2008).

Zachariah (1995) writes that the Salt Lake City Fire Department began utilizing downgraded responses to less severe calls in 1978. Clawson (2002) tells us that Salt Lake City has utilized triaged responses for cold responses to bravo calls since 1998.

Sometimes cities have adopted downgraded response policies as a result of tragic incidents. That was the case in the City of St. Louis Fire Department. According to Ludwig (2002) the city adopted an “on-the-quiet” response policy of only utilizing red lights and sirens to calls that involved the loss of property or life after the agency suffered three apparatus accidents in a single day.

The City of Los Angeles adopted tiered response utilizing Medical Priority Dispatching in March 1990 according to Clawson (1991). After two years of utilization Clawson states that he was unaware of a single formal citizen complaint regarding response policies.

It would seem clear that many of the major metropolitan EMS agencies in our nation have taken the lead and adopted “cold” response policies without any major impediments. In fact of the 200 largest cities in the United States only 30% utilize a hot response on all EMS responses (Monosky, 2002).

Research question five: How do other EMS agencies determine response modes?

Medical Priority Dispatching Systems (MPDS) is utilized by over 3,800 agencies in 13 different countries (L’Heureux, Personal communication, September 7, 2008) including Salt Lake City (Clawson, 1991) and the City of Los Angeles (Clawson, 2002) which use the protocols to determine ambulance response modes. Additionally the centralized E-911 public safety answering point for the State of New Hampshire utilizes Medical Priority Dispatching Systems (Marion, 2001).

Survey question five of the New Hampshire Call Determinant survey conducted by this researcher asked “Does your agency utilize call determinant information provided by E-911 to determine the type of response mode (ie: respond with traffic for alpha calls) for the ambulance?” There were 93 responses to this question. 34.4% indicated “No, and have no plans to implement”, another 32.3% indicated “No, but may consider in the future”, 6.5% indicated “No, but planning to implement”. Only 26.9% of respondents indicated that their agency currently utilized call determinants to determine response mode.

Research question six: What industry accepted standards exist for triaging ambulance response modes?

Emergency Medical Dispatching is the concept of providing pre-arrival instructions to a caller reporting a medical emergency in an effort to provide care before the arrival of First Responders. The first documented utilization of this was in Phoenix, Arizona in 1975 when a paramedic provided a caller with medical directions (Zachariah, 1995). This idea was coupled with the notion that not all EMS calls require an emergency response. Soon “send the right thing to the right person at the right time” concept was born (Clawson, 1991). In 1989 a position paper stating that Emergency Medical Dispatching (EMD) was an integral part of the EMS system was released by the National Association of EMS Physicians (Clawson, 1989). This paper cements the concept that EMD, and the procedure of responding cold to some medical incidents is an accepted standard of care.

There are a number of commercially available emergency medical dispatching programs utilized throughout the industry. These include the Medical Priority Dispatch System (Allen, 1991), PowerPhone and the Association of Public-Safety Communications Officials (APCO) (EMS Resources, 2007). Another program called Criteria Based Dispatch is available from King County, Washington (Culley et al, 1993)

Further evidence of industry accepted standards can be found in the American Society for Testing Materials (ASTM) dispatch standards, covering EMD Management, practice for EMS, and instructor and dispatcher qualification (EMD Resources, 2007). These standards clearly identify that providing EMD is the expected industry standard.

During an interview with Stephen L'Heureux of the New Hampshire Bureau of Emergency Communications, the New Hampshire system is the only accredited MPDS state-wide agency in the country. The New Hampshire system includes numerous measures to assure quality service is provided. Perspective 911 telecommunication operators must attend a full time 12 week training program which includes one entire week dedicated to EMD. On an ongoing basis 4% of the calls received by E-911 are reviewed for quality assurance and protocol compliance. The New Hampshire system consistently scores in the 97-99% range for EMD protocol compliance. Due to limitations on access to information there have not been any local comprehensive studies on accuracy of the condition reported by the caller versus what was found by the responders.

Research question seven: What legal issues are associated with triaging response modes to EMS incidents?

A review of the literature available did not uncover any references to any statutory requirements to respond to medical incidents utilizing red lights and sirens. In fact, nationally recognized standards of care have been established by the National Association of EMS Physicians (NAEMSP) through the publication of a white paper. This paper established that medical priority dispatching is an "integral part" of EMS and that ambulance responses should be appropriate to the emergency (Clawson, 1989). The same group released a position paper clearly stating that is not a violation of "generally accepted standards" by responding cold to a 911 call (Clawson, 1994).

Does the public expect that we are triaging responses as established in the NAEMSP, and are we opening the door to liability by not responding cold to some calls? To help answer

this we can turn to a case from Florida in which an 18 month old girl was found unresponsive in a pool (Harwood, et al., 1995). The victim's 13 year old sister called 911 but was not given any prearrival instructions. The mother, feeling that the dispatch agency did not meet public expectations sued the dispatch center and formed an action group called Parents Against Negligent Dispatch Agencies (PANDA). Although this case focuses on the delivery of pre-arrival instructions it clearly demonstrates that the public is aware that certain standards exist and expect their local agencies to adhere to those standards. When we fail to meet those standards we open ourselves up to litigation.

Wolfberg (1995) writes hot response intersection crashes is one of the greatest source of claims for the Galtfelter Insurance Group. In fact, for volunteer ambulance services there was 25 times more accident related claims versus malpractice claims. It is clear that there are numerous successful ambulance response related lawsuits.

According to Stephen L'Heureux of the New Hampshire Bureau of Emergency Communications several large EMS agencies in New Hampshire have utilized call determinants to respond cold to alpha calls for several years. Yet, there has never been a civil legal action in New Hampshire due to EMD call prioritization.

Research question eight: What the impact on pre-hospital care would be for downgraded response incidents?

To address this question research was conducted to compare alpha and delta calls that Londonderry Fire Department responded to between April 1 – May 31, 2008. These calls were assigned call determinants by the State of New Hampshire's E-911 which utilizes a centralized public safety answering point in the state and utilized Medical Priority Dispatch System software

(Marion, 2001). Call determinants are sent to the Londonderry Fire Department Dispatch Center over a closed circuit computer system provided by the New Hampshire Bureau of Emergency Communications. The call determinant is then recorded in Londonderry Fire Department's computer dispatch program, Red Alert.

During the study period 246 EMS calls were examined. Of these calls 148 were deemed to have unreliable call determinant information recorded. Many calls had no call determinant recorded at all in the dispatch record, others had call determinant recorded but they were calls that were not received from E-911. Some of these calls included medical alarms, direct calls from an Urgent Care Center, or medical requests received directly from the airport in this community. These calls were removed from the study as it would appear that the dispatcher entering the call may have simply estimated the call determinant.

Of the 98 remaining calls 15 were triaged as alpha; 13 were bravo; 32 were charlie, 35 delta and 3 echo. For the purposes of this study alpha calls (least serious) were compared to delta calls (more serious) because there were more deltas than echo calls (most serious). This provided a more data to be evaluated to help determine the accuracy of the call coding. A table was compiled comparing a variety of data points of the alpha and delta categorized calls (Appendix I). The most significant information derived from this study is included in Table 2 below.

Table 2

*A comparison of alpha and delta calls at Londonderry Fire Department:*

*Percentage of patients receiving each procedure/service*

Procedure	Alpha	Delta	Delta more likely to receive
Transported	80.0%	80.0%	0%
ALS Care	66.7%	74.3%	+11%
BLS Care	27%	20%	-25%
RLS Transport	26.7%	37.1%	+39%
<u>Treatments provided</u>			
Oxygen	33.3%	51.4%	+54%
EKG	26.7%	48.6%	+82%
IV	60.0%	68.6%	+14%
Medications	40%	37.1%	-7%

As we look at the comparison of these two types of call determinants, alpha (least serious) and delta (serious) it should be noted that the Londonderry Fire Department does not currently inform responders of the triage category for any responses. Field personnel have no knowledge of the call determinants during or after the call. Additionally, paramedics are staffed on all ambulances in Londonderry which utilizes a single tier (ALS only) response model. Every ambulance response examined for this study had at least one paramedic assigned to that

apparatus. Additionally, for the purposes of this study oxygen and IV saline are not considered “medications”.

An analysis of the data included in table one indicates that there is no difference in the likeliness of a delta call to be transported as compared to an alpha call. Both categories were transported 80% of the time. The majority of the data regarding treatments and procedures indicates that delta patients are in need of more advanced care. Delta patients were 11% more likely to receive advanced life support care than alpha patients identified as alpha. Delta patients were transported to the hospital utilizing red lights and sirens 39% more often than alpha patients.

Delta patients generally received more treatments as well when compared to alpha. Delta patients received EKGs 82% more often; oxygen 54% more often and IV therapy 14% more often than alpha patients.

The single exception to this trend was that delta patients received medications 7% less of the time than alpha patients. This finding was examined more in depth and it was determined that all of the medications administered to alpha patients were for non-life threatening conditions. Of the 15 alpha calls analyzed for this study, six patients received medication administration. Of these six patients, two received fentanyl; one received toradol and fentanyl; one received toradol and morphine; one received toradol; one received zofran. All of these medications are utilized for either pain control (fentanyl, toradol, morphine) or to combat nausea (zofran). None of these medications are considered life-saving medications in the capacity that they were utilized during these calls.



In table 3 we will examine the provider impressions and call dispositions listed on the patient care report for the alpha calls being analyzed.

Table 3

*Provider impressions and call disposition*


---

Incident #	Provider impression	Disposition
0747	Dehydration	ALS Transport
0818	Allergic reaction	Refusal
0893	Pain	ALS Transport
0917	Weakness	BLS Transport
0927	Abdominal pain/problems	Cancelled
0939	Traumatic injury	ALS Transport
0996	Cancer	ALS Transport
1059	Seizure	ALS Transport
1075	Abdominal pain/problems	ALS Transport
1092	Traumatic injury	ALS Transport
1094	Pain	BLS Transport
1120	No apparent illness/injury	Refusal
1123	Cancer	ALS Transport
1146	Dehydration	ALS Transport
1150	Pain	ALS Transport

---

An analysis of table 3 reveals that Londonderry patient care providers did not document any provider impressions that would be life threatening. Several of the impressions could be situations that might develop into life threatening situations. These reports were reviewed to evaluate the severity of these patients. The results are listed in the following paragraphs.

Incident 0818 was an allergic reaction, this patient called 911 to report that she began having localized hives 15-20 minutes before calling. She had no recollection of being exposed to anything. This patient refused transport. Pt did not receive any EMS treatments.

A review of call 0939 shows the provider found a traumatic injury. This patient reported a possible shoulder fracture which was sustained when he fell from a standing position walking his dog. This patient denied any other complaints and presented waiting outside with a possible deformity to his right shoulder and clavicle. This patient walked to the ambulance was given an IV and administered Fentanyl for pain control and transported to the hospital in a non-emergency mode.

During call 1059 the care provider noted seizure as the primary impression. This call involved a 21 year old female who experienced a seizure while watching television. According to the patient's mother the full body seizure that lasted about 1 minute. This patient was recovering from the flu and had recent medication changes. EMS reports the patient to be postictal upon their arrival. This patient was given oxygen, an EKG was performed and an IV established. This patient was transported to the hospital without red lights or siren.

In call 1092 the care provider found a traumatic injury sustained by a 84 year old female believed that her artificial hip had become dislocated again. EMS arrived to find the patient sitting at a picnic table awaiting their arrival. This patient was moved to the ambulance, an EKG

is performed, an IV established and fentanyl was administered due to her 6 out of 10 pain severity. This patient was transported in non-emergency mode to a local hospital.

Although some of the provider impressions listed in Table 3 would be suspect for being a life threatening situation, thorough analysis of these patient care reports indicates that none of these cases were actually life threatening. Hinchey et al. (2007) concluded in a study evaluating the accuracy of MPDS that the protocols were accurate 99% of the time. A study of patients identified as cardiac patients (Reily, 2006) found that MPDS tended to over triage patients as being cardiac when they really were not. The study concluded that MPDS over-triages cardiac patients 70.4% of the time and that 40% of the cardiac patients studied were discharged from the emergency department with a non-cardiac diagnosis.

Stephen L'Heureux, who is the Medical Dispatch Quality Control Supervisor for NH E-911 states that the 33 EMD protocols utilized by MPDS are not arbitrary. The protocols, instructions and prioritization are all based on science and reviewed and approved by physicians. As an example L'Heureux points out that the protocol for chest pain assigns an "alpha" priority for a patient who is under 35 years old and has no "priority symptoms". This algorithm is based in part on the Framingham Heart Study that has shown that patients under 35 years old with chest pain and no other symptoms are unlikely to be having a cardiac event.

L'Heureux provided a copy of the New Hampshire Emergency Communications August 2008 Quality Improvement report (Appendix M). This report shows that out of the 431 calls reviewed the proper key questions were asked by the E-911 operator 98.55% of the time and that 97.54% of the calls were found to have been properly coded based on the information provided by the caller.

The data included in tables 2 and 3 indicate that no life threatening conditions were inappropriately identified as alpha calls that Londonderry Fire Department responded to during the study period. All treatments, rendered to patients triaged as alpha were for comfort measure (pain control and anti-nausea). Although these treatments do provide increased comfort and relief for the patient they do not represent life-threatening conditions.

This research shows that the impact on prehospital care would have been a delay of ambulance arrival by one minute and six seconds. However, no life saving interventions were performed for any of these patients and the only medications administered were for comfort care measures. There would have been no impact on overall patient outcome caused by a downgraded, cold response to these calls.

Research question nine: What emergency department care might be delayed for incidents that could be responded to on a downgraded response mode?

In order to answer this research question it was necessary to conduct chart reviews of alpha patients transported to a hospital. Research was limited to alpha patients that were transported by to Londonderry Fire's medical resource hospital (MRH), Parkland Medical Center in Derry, NH. This researcher was able to gain access to detailed information regarding patient care that occurred in the Emergency Department (ED) and the patient's disposition. Five patients met the criteria for this research. While reviewing this data please note that a delay is often between when EMS arrived at the hospital and when the ED chart indicates "Patient arrived". This discrepancy is due to several factors including that the EMS arrival time is generally when the ambulance is turning into the parking lot of the hospital, time to move the patient from the ambulance to the ED, occasionally waiting for a room or staff member is available, or taking

report from the EMS provider before “arriving” the patient in the hospital’s computer system. The results are listed in tables 4 through 7.

Table 4

*EMS and Emergency Department (ED) patient care events for call number 200800939*

---

Provider impression: Traumatic injury

Emergency Department disposition: Discharged home with sling for shoulder injury, follow up with orthopedics

Times	Event	Time elapsed	Time elapsed after ED arrival
23:35	EMS: Dispatched	0 min.	NA
23:44	EMS: Patient contact	9 min.	NA
23:54	EMS: IV established	19 min.	NA
23:56	EMS: Fentanyl	21 min.	NA
00:08	EMS: Fentanyl	33 min.	NA
00:08	EMS: Arrive at hospital	33 min.	0 min.
00:29	ED: Patient arrived	54 min.	19 min.
00:48	ED: Dilaudid	73 min.	40 min.
00:48	ED: X-ray	73 min.	40 min.
01:00	ED: PO Pain meds	85 min.	52 min.

---

Table 5

*EMS and Emergency Department (ED) patient care events for call number 200801059*

---

Provider impression: Seizure

Emergency Department disposition: Discharge home with appointment with primary care physician on the following day.

Times	Event	Time elapsed	Time elapsed after ED arrival
15:34	EMS: Dispatched	0 min.	NA
15:40	EMS: Arrive at patient	6 min.	NA
15:50	EMS: Oxygen	16 min.	NA
15:57	EMS: EKG	23 min.	NA
15:58	EMS: IV	24 min.	NA
16:15	EMS: Arrive at hospital	41 min.	0 min.
16:30	ED: Pt arrived	56 min.	15 min.
16:48	ED: Ativan (for nerves during CT)	74 min.	33 min.
16:48	ED: CT	74 min.	33 min.

Table 6

*EMS and Emergency Department (ED) patient care events for call number 200801092*

Provider impression: Traumatic injury

Emergency Department disposition: Reduction of dislocation in ED by orthopedic physician, discharge to home.

Times	Event	Time elapsed	Time elapsed after ED arrival
15:01	EMS: Dispatched	0 min.	NA
15:04	EMS: Patient contact	3 min.	NA
15:04	EMS: IV	3 min.	NA
15:15	EMS: Fentanyl	14 min.	NA
15:26	EMS: Arrive at hospital	25 min.	0 min
15:36	ED: Patient arrived	35 min.	10 min.
16:11	ED: Pain medication	70 min.	45 min.
16:11	ED: X-ray	70 min.	45 min.

Table 7

*EMS and Emergency Department (ED) patient care events for call number 200801150*

---

Provider impression: Pain

Emergency Department disposition: Discharge home, follow up with primary care physician.

Times	Event	Time elapsed	Time elapsed after ED arrival
06:57	EMS: Dispatched	0 min.	NA
07:08	EMS: Arrive at patient	11 min.	NA
07:08	EMS: IV	11 min.	NA
07:10	EMS: Toradol	13 min.	NA
07:20	EMS: Morphine	23 min.	NA
07:30	EMS: Morphine	33 min.	NA
07:35	EMS: Arrival at hospital	38 min.	0 min.
07:41	ED: Patient arrived	44 min.	6 min.
09:00	ED: IV pain meds	123 min.	79 min.
09:00	ED: IV anti-nausea meds	123 min.	79 min.

---

An analysis of the data in Tables 4-7 reveal that no emergency department care would have been affected by responding cold to any of these patients. Although each of these patients did receive medications after arrival in the emergency department, the mean interval between



EMS arrival at the emergency department and ED administration of the first medication was 49.25 minutes, with a range of 33-79 minutes and these medications did not represent life saving procedures. All medications administered were for pain control (3 patients); anti-nausea (1 patient); and anti-anxiety (1 patient).

Chart reviews reveal that no life saving interventions were performed and no life saving medications were administered for any of these patients. The data indicates that no care would have been delayed had these patients arrived later due to a cold response to the scene of the emergency.

Research question ten: What cultural or organizational issues may impede implementing a triaged response mode to EMS incidents?

The action of driving an ambulance utilizing red lights and sirens is an alluring draw to this business for many. George et al (1991) even considers this action to be “intoxicating”. Davis (2002) quotes an EMS system manager as stating that there is a “little bit of EMT and a little bit of race car driver” in many of his employees.

Historically the EMS response model has been based on the concept of “maximal response” (Clawson, 1991) which requires all apparatus to respond to the incident as quickly as possible in an emergency mode. EMS has followed suit with other public safety disciplines by having employees develop a mindset that puts their own safety behind those that are in need of assistance (Garrison, 2002). The fire service has never embraced change easily. Clawson (2002) equates the fire services receptiveness to reducing hot responses to how receptive the National Rifle Association is to gun control.

In New Hampshire statewide EMD was first introduced with the implementation of statewide 911 services in mid-nineties. According to Stephen L'Heureux from the New

Hampshire Bureau of Emergency Communications, the concept of EMD in New Hampshire was met with some reservations initially. L'Heureux recounted that an organization representing unionized firefighters in New Hampshire, which includes as one of its missions to "be the voice of public safety employees in legislative and regulatory matters" (Mission Statement of the PFFNH), had concerns about EMD and had considered seeking a legal injunction to halt implementation. According to L'Heureux, a primary concern of this organization was that call prioritization may result in low priority ambulance calls to be assigned non-emergency ambulances from private ambulance companies, therefore reducing the need for Fire Department ambulances.

These concerns were exemplified because New Hampshire's E-911 implementation was statewide which meant that implementation of EMD was going to affect all public safety agencies in the state. After extensive discussion between all of the parties involved it was established that E-911 will provide EMD and call prioritization. This information would be sent to local dispatch centers and local policies will dictate what type of response will be assigned. No legal action was ever taken and statewide E-911 with EMD went live in 1995.

Even today L'Heureux states that there is still a cultural divide on the issue with some Departments still encouraging residents to call the local seven digit phone number if they have an emergency. There remains a perception in some people's minds that "Concord" (E-911) asks too many questions and significantly delays the call from reaching the local dispatch centers. There is also a high degree of resistance to MPDS questions when the person calling 911 possess medical training such as a firefighter, EMT, paramedic or nurse. L'Heureux states that it is not uncommon for these callers to argue with the 911 operator and to refuse to answer questions and demand that they "just send the ambulance". Another issue faced by New Hampshire's E-911

system is that callers do not realize that they are calling a center that may be over 100 miles away from where they are. Callers who know that their local emergency services are located nearby sometimes can't understand why they just don't drive over.

On June 5, 2008 this researcher attended an in-service training session for the Derry (NH) Fire Department conducted by their EMS Director, Chuck Hemeon. At the time the Department was preparing to implement cold responses for alpha calls starting July 1, and this training was intended to educate the field personnel. Several members of the audience expressed skepticism that E-911 would be able accurately triage the call. A common concern is that E-911's information is based upon sometimes hysterical callers.

A survey of Londonderry Fire Department employees was conducted in May 2008 to gauge possible cultural roadblocks to implementing a cold response to certain EMS calls (Appendix F). The results of this survey indicated that only 40% of the respondents felt that *all or nearly all* ambulance responses should utilize red lights and sirens. 35% felt that call determinants should be utilized while 25% felt other methods should be utilized (Appendix G). When asked if the reader felt that ALL ambulance calls require a red lights and siren response on 10% felt that RLS response was always required. 60% of the respondents felt that RLS responses placed them at moderate risk of personal injury, with another 20% responding that the risk was high.

Only two respondents indicated that they have previously worked for a service that utilized call determinants for response mode, and both indicated that they did not feel that patient care was adversely affected by this policy. The final question asked the survey taker "How do *you feel* about sending an ambulance "with traffic" to certain low-acuity EMS calls as

determined by E-911?” Responses to this question were tied at 47.4% agreeing and 47.4% disagreeing with the concept and one respondent representing 5.3% had no opinion.

Some employees wrote in some personal thoughts which shed some additional light on how members of the fire service view the concept of responding cold to EMS calls. Some of these thoughts were:

“When a customer calls 911 they feel they have an emergency...To change or disagree with the caller based on the above information would put the FD at risk”

“We are still responsible to travel and maintain a safe mode of travel. Implying that light(s) allows us to stand above the law with lights (and) sirens is wrong (and) should be corrected immediately.”

“Response times are important to consider in regard to “non-emergent” responses. To get resources to an incident in compliance with nationally recognized response standards is an important benchmark to strive for....Non-emergency responses would also delay turnaround times for “status 4’s” (non-transports). Doubling response times ties units up for longer periods of time - keeping them unavailable for subsequent calls.”

However, a statewide survey conducted for the research paper indicates more services are considering utilization of call determinants. 65.7% of respondents to this survey indicated that they currently implement (26.9%), are in the planning stages of implementation (6.5%), or may consider implementation (32.3%) of response mode determination based on call determinants. Responses to question four also indicated that 34.4% of respondents indicated “No, and have no plans to implement” determining response mode by call determinant. Question eight asked the survey taker “How do *you feel* about sending an ambulance with traffic to certain low acuity

EMS calls as determined by E-911?” 51.6% of the respondents indicated that they agreed with this concept. 37.4% disagreed and 11.0% had no opinion on the issue (Appendix E).

L’Heureux states that surprisingly, one of the biggest pushes for EMD may come from increased Medicare and Medicaid scrutiny and the need to justify billing patients at certain bundled rates. EMS services may want to be able to send a BLS ambulance to a patient that will only be paid at a BLS rate, or services may need to justify why they are billing for an ALS ambulance for certain patients. Across the country ambulance services are beginning to utilize MPDS call determinants as evidence as to why a certain service was provided. This is a very new, but growing trend according to L’Heureux.

Based on the findings of the literature review and original research, the further development of a proposed standard operating guideline (SOG) was warranted. This researcher utilized the Londonderry Fire Department standard operating guideline template as a starting point. Elements of a neighboring community’s alpha response policy, as well as Londonderry Fire Department’s Dispatch and Response Guidelines for Responding to 40 Buttrick Road (Urgent Care) and advice from L’Heureux advising that Urgent Care Center ambulance requests should go through E-911 in order to provide a uniformed call determinant.

The draft of this SOG was circulated to several Captains of the department for feedback. Revisions to the SOG were made based on feedback by Captains Heinrich, Cardwell and Tetreault and revisions were made to the proposed SOG based on feedback received.

A proposed SOG was drafted based on these documents (Appendix N). This new SOG establishes that EMS calls received from E-911 and triaged as alpha will be responded to with traffic in a non-emergency mode. Additionally, this guideline would end the policy of the local

Urgent Care Center calling Londonderry Fire Department directly to request an ambulance. All requests for ambulances would now be placed through E-911, allowing proper call determinants to be assigned. This SOG calls for all alpha calls from this facility to now receive an ambulance only responding cold.

This proposed SOG will be presented for consideration at an upcoming Department Officer's Meeting. If this program is approved for implementation, internal training of personnel will be conducted in conjunction with the New Hampshire Bureau of Emergency Communications.

#### Discussion

Literature and research supports the premise that the Londonderry Fire Department can utilize established and available tools to determine the most appropriate method to respond to EMS calls, creating a safer environment for our employees and the public while not adversely affecting patient care.

It is no longer possible to justify the indiscriminate use of red lights and sirens to respond to all medical calls simply because a call was made to 911. The public expects that dispatch centers are going to provide a certain level of service (Harwood, et al., 1995). A nationally recognized standard of care has been established stating that dispatch centers will prioritize calls (Clawson, 1989) and that the decision to respond an ambulance utilizing red lights and sirens should be based on the situation and problem with the patient (Clawson, 1994). In fact, this concept is already utilized by 70% of the 200 largest cities in the United States (Monosky, 2004). In New Hampshire, Medical Priority Dispatching System (MPDS) is utilized by the centralized public safety answering point for the entire state (Marion, 2001).

We know that Medical Priority Dispatching System is accurate 99% of the time when triaging alpha calls (Hinchey, et al., 2007) and that MPDS tends to err on the side of caution (Reilly, 2006). Research of alpha calls triaged by New Hampshire E-911 and responded to by the Londonderry Fire Department shows that none of these calls represented life threatening emergencies. Of the four calls included in a chart review of care received after arrival at the Emergency Department (ED) these patients waited, on average 49.25 minutes before they received any medications in the ED, with 33 minutes being the shortest wait.

A comparison of New Hampshire E-911 call determinants indicates that MPDS accurately identifies that alpha calls are less serious than delta calls as indicated by procedures administered. Research shows that delta call determinants are 11% more likely to receive ALS care, 39% more likely to be transported utilizing red lights and sirens, 54% more likely to be administered oxygen, 82% more likely to have an EKG performed and 14% more likely to have an IV established. This research was based on an EMS service that staffs paramedics on all ambulances.

We know that emergency driving puts not only our employees, but the public at risk. Ambulance crashes are a major factor contributing to an employee fatality rate that is more than twice the national average (Maguire, et al., 2002). A report by the Centers for Disease Control and Prevention (2003) found that there were more than 300 fatal ambulance crashes between 1991 and 2002. These accidents resulted in the deaths of 275 people who were not occupants of the ambulances involved in the crashes.

Although EMS has long utilized the maximal response philosophy of responding all resources as quickly as possible (Clawson, 1991) very little time is actually saved. According to

a study conducted by Brown (et al., 2000) only 1 minute and 46 seconds on average was saved by utilizing red lights and sirens. While other studies have found greater time savings of 3.02 minutes in an urban setting (Ho and Casey, 1998) and 3.63 minutes per call in a rural area (Ho and Lindquist, 2001). A study of Londonderry Fire Department responses showed a 1 minute and 6 second time savings by utilizing RLS. The time savings realized by responding hot do not represent clinically significant differences when considered against an average interval of 49.25 minutes between when an ambulance arrives at an emergency department and the first medication is administered by hospital staff for alpha patients researched for this paper. The EMS industry has held itself to an 8 minute response standard although there are no laws that stipulate this requirement (Ludwig, 2004) and some suggest that the requirement is arbitrary to begin with and not evidence based (Price, 2006). We must also call for updates to national standards such as NFPA 1710 which call for a set response time regardless of the nature of the problem (Ludwig).

The EMS and Fire culture will not be receptive to the notion of reducing our use of red lights and sirens for medical calls (Clawson, 2002). There exists the possibility of mistakes in the call triaging process (Feldman, 2006). This needs to be considered as a risk-to-benefit decision and compared against results such as Salt Lake City which had a 78% reduction in emergency vehicle collisions or St. Louis with a 62% reduction in accidents after implementing cold response policies.

In summary EMS agencies have an obligation to utilize all available tools to protect not only their employees, but the public from the risk of being injured or killed in an ambulance crash. They need to assure that the use of red lights and sirens responding to EMS calls is as medically justified as any other procedure performed. Agencies should implement the use of



accepted and standardized methods in order to determine when the use of red lights and sirens is justified. Research supports that the Medical Priority Dispatch System is statistically highly accurate, that responding hot increases the likeliness of a crash while saving only a minimal amount of time, and that the time saved is clinically irrelevant in the outcome of alpha triaged patients.

Many people in this industry seem to be aware of a war story about MPDS under coding a call resulting in a cold response to someone who was seriously ill or died even though many of these accounts are unverifiable. What we will never know is how many lives have been saved and injuries prevented because of ambulances responding in a safer, cold response mode.

### Recommendations

Based on literature review, original research and data analysis the results of these findings could help create a safer environment for employees and the public, albeit with a required change in accepted culture.

The following recommendations are made to the Londonderry Fire Department:

- Adoption of the proposed response SOG (Appendix N) establishing that alpha calls will be responded to without the use of red lights and sirens. There is ample scientific data available to justify that this practice will save lives and reduce risk by reducing the number of hot responses.
- The Department should develop a training program outlining why this change is being implemented and be prepared for numerous “What if” questions. Personnel should be advised that if they identify any apparent miscoding of calls by E-911 that they should be reported so that a follow-up may be initiated.

- The Communications Division should conduct training with all dispatchers specifically related to the roll out of this SOG.
- A larger scale study of calls triaged as alpha as compared to the interventions provided by the EMS crew as an indication of severity should be conducted.
- Continued evaluation of the alpha cold response program in the neighboring town of Derry, New Hampshire should be conducted to identify any problems with the policy
- Retrospective analysis of calls responded to cold and the ED outcome should also be conducted after several months of cold response data has been compiled.
- A six month review of the alpha cold response policy should be conducted.

## References

- Allen G. (1991). Emergency Medical Dispatching. [Electronic version]. *Dispatch Monthly*. Retrieved August 17, 2008 from [http://www.911dispatch.com/stories/stories\\_old/story-13-old.html](http://www.911dispatch.com/stories/stories_old/story-13-old.html)
- Brown L.H., Whitney C.L., Hunt R.C., Addario M., and Hogue T., (2000, January-March). Do warning lights and sirens reduce ambulance response time?. *Prehospital Emergency Care*, 4, 70-74.
- Centers for Disease Control and Prevention. (2003, February 28). Ambulance crash-related injuries among emergency medical services workers – United States, 1991-2002 (*Morbidity and Mortality Weekly Report*; 08:154-156).
- Clawson J.J. (1989, October-December). Position paper: emergency medical dispatching. [Electronic version]. *Prehospital and Disaster Medicine*, 4(2). Retrieved on August 17, 2008 from <http://www.emergencydispatch.org/articles/positionpaper1.htm>
- Clawson J.J. (1991, July). Running “hot” and the case of Sharon Rose. *Journal of Emergency Medical Services*, 16, 11-13.
- Clawson J.J. (1994). Use of warning lights and siren in emergency medical vehicle response and patient transport. [Electronic version]. *Prehospital and Disaster Medicine*, 9(2). Retrieved on March 16, 2008 from <http://www.emergencydispatch.org/articles/useoflights1.htm>
- Clawson J.J. (2002, October). Unnecessary lights-and-siren use: a public health hazard. *Public Management* .

Culley L., Eisenberg M., Horton C., Koontz M., (1993, July). Criteria based dispatch send the appropriate providers to the scene. *Emergency*, 29-33.

Davis R., (2002, March 21). Speeding to the rescue can have deadly results. *USA Today*. Retrieved July 7, 2008, from <http://www.usatoday.com>

EMD Resources. (2007). [Retrieve electronically]. *Dispatch Monthly*. Retrieved August 17, 2008 from <http://www.911dispatch.com/info/emd/index.html>

Feldman M.J., Verbeek P.R., Lyons D.G., Chad S.J., Craig A.M., Schwartz B., (2006, September). Comparison of the medical priority dispatch system to an out-of-hospital patient acuity score. *Academy of Emergency Medicine*, 13, 954-960.

Garrison H.G., (2002, December). Keeping rescuers safe. *Annals of Emergency Medicine*, 40, 633-635.

George J.E., Quattrone M. S., Quattrone J.D., (1991, Fall). Above all-do no harm. [Electronic version]. *Emergency Medical Technician Legal Bulletin*. Retrieved July 7, 2008 from <http://www.emergencydispatch.org/articles/donoharm1.htm>

Harwood D., Shelper P., Gunderson M., (1995, July). Why EMS needs rocks management. *Journal of Emergency Medical Services*, 20, 31-34

Hinchey P., Myers B., Zalkin J., Lewis R., Garner D., (2007). Low acuity EMS dispatch criteria can reliably identify patients without high-acuity illness or injury. *Prehospital Emergency Care*, 11, 42-48.

Ho J., Casey B., (1998, November). Time saved with the use of emergency warning lights and sirens during response to requests for emergency medical aid in an urban environment. *Annals of Emergency Medicine* 32, 585-588.

Ho J., Lindquist M., (2001). Time saved with the use of emergency warning lights and sirens during response to requests for emergency medical aid in a rural environment. *Prehospital Emergency Care*, 5, 159-162.

Levick N.R., (2006, April). A simple question. *Wings, Wheels & Rotors* 23(2), 11

Ludwig G., (2002). Emergency medical runs: urgent vs. non-urgent. [Electronic version]. *Firehouse*. Retrieved July 7, 2008 from <http://www.firehouse.com/ems/Ludwig/2002/june.html>

Ludwig G., (2004). EMS response time standards. *Emergency Medical Services Magazine*, 33, 44.

Maguire B.J., Hunting K.L., Smith G.S., Levick N.R. (2002, December). Occupational fatalities in emergency medical services: a hidden crisis. *Annals of Emergency Medicine*, 40(6), 625-32.

Marion A.J. (2001). No title. *EMS Insider Magazine*, 1

*Mission Statement for the PFFNH* (n.d.) Retrieved September 7, 2008 from [http://www.pffnh.org/index.cfm?zone=/unionactive/view\\_page.cfm&page=Our20Mission](http://www.pffnh.org/index.cfm?zone=/unionactive/view_page.cfm&page=Our20Mission)

Monosky K., (2004, February). The JEMS 2003 200 city survey. *Journal of Emergency Medical Services*, 29, 38-53.

New Britain EMS saves lives and \$\$\$ without running hot. (2008, February). *Best Practices in Emergency Services*, 11, 13, 24.

Price L., (2006) Treating the clock and not the patient: ambulance response times and risk. *Quality and Safety in Healthcare*, 15, 127-130.

Riley M. J., (2006 March-April). Accuracy of a priority medical dispatch system in dispatching cardiac emergencies in a suburban community. *Prehospital and Disaster Medicine*, 21, 77-81.

Rosica J.L., (2008, July 8). Widow sues over ambulance response in Florida. [Electronic version]. *Associated Press*. Retrieved August 16, 2008 from <http://publicsafety.com/online/printer.jsp?id=1577>

U.S. Department of Homeland Security (2006). Unit 7: Organizational culture and change. *Executive Development* (p. SM 7-1). Emmitsburg, MD

U.S. Department of Homeland Security (2007, April 15). Operational Objectives. In *Strategic Plan*. Retrieved August 17, 2008, from <http://www.usfa.dhs.gov/about/strategic/>

*What is Pro-QA*. (n.d.) Retrieved August 17, 2008 from <http://www.emergencydispatch.org/articles/whatis.html>

Wolfberg D., (1995, February). Lights, sirens and liability. *Journal of Emergency Medical Services* 21, 38-40

Zachariah B.S., (1995). The development of emergency medical dispatch in the USA: a historical perspective. [Electronic version]. *European Journal of Emergency Medicine*. Retrieved July 7, 2008 from <http://www.emergencydispatch.org/articles/historicalperspective1.htm>

Appendix A



Staff Review  
 From 07/01/06 To 06/30/07  
 Report Printed On: 08/25/2008

Response Code	#	%
Lights and Sirens	1755	96.43%
Lights Only - No Sirens	1	0.05%
No Lights and Sirens	39	2.14%
Not Applicable	25	1.37%
<b>Total</b>	<b>1820</b>	<b>100.00%</b>
Transport Code	#	%
Initial Lights and Sirens, Downgraded to No Lights or Sirens	1	0.06%
Initial No Lights or Sirens, Upgraded to Lights and Sirens	3	0.17%
Lights and Sirens	399	22.92%
Lights Only - No Sirens	60	3.45%
No Lights or Sirens	537	30.84%
Not Applicable	738	42.39%
Not Available	2	0.11%
Not Known	1	0.06%
<b>Total</b>	<b>1741</b>	<b>100.00%</b>
Response Disposition	#	%
Cancelled	196	10.77%
Cancelled - Out of Primary Service Area	4	0.22%
Cancelled - Request Transferred to Another Provider	5	0.27%
Dead at Scene	3	0.16%
No Patient Found	33	1.81%
No Treatment Required	233	12.80%
Not Applicable	3	0.16%
Not Known	1	0.05%
Patient Refused Care	267	14.67%
Standby Only - No Patient Contacts	42	2.31%
Treated and Released	28	1.54%
Treated, Transferred Care	52	2.86%
Treated, Transported by EMS	5	0.27%
Treated, Transported by EMS (ALS)	668	36.70%
Treated, Transported by EMS (BLS)	269	14.78%
Treated, Transported by Law Enforcement	3	0.16%
Treated, Transported by Private Vehicle	2	0.11%
Unable to Locate Patient/Scene	6	0.33%
<b>Total</b>	<b>1820</b>	<b>100.00%</b>
Response Request	#	%
911 Response (Scene)	1718	95.34%
Flagdown/Walk-in	13	0.72%
Flagdown/Walk-in Non-emergent	10	0.55%
Intercept	2	0.11%
Medical Transport	3	0.17%
Mutual Aid	41	2.28%
Not Applicable	11	0.61%
Standby	4	0.22%
<b>Total</b>	<b>1802</b>	<b>100.00%</b>
Responding Unit	#	%
1FDXE45F31HA73883	382	20.95%
1FDXE45P33HA90625	1342	73.61%
Car 2	2	0.11%
Engine 1	43	2.36%
Engine 2	31	1.70%
Engine 3	1	0.05%
Engine 5	5	0.27%
Not Applicable	14	0.77%
Not Available	2	0.11%
Rescue 1	1	0.05%
<b>Total</b>	<b>1823</b>	<b>100.00%</b>

Search Criteria	
Dates	From 07/01/2006 To 06/30/2007
Service	Londonderry Fire Department
Staff	All
Type of Service Requested	All
Patient Disposition	All

Appendix B

Staff Review Report

Page 1 of 1



Staff Review  
From 07/01/07 To 06/30/08  
Report Printed On: 08/25/2008

Response Code	#	%
Initial Lights and Sirens, Downgraded to No Lights or Sirens	3	0.15%
Lights and Sirens	1899	96.54%
No Lights and Sirens	42	2.14%
Not Applicable	23	1.17%
<b>Total</b>	<b>1967</b>	<b>100.00%</b>
Transport Code	#	%
Lights and Sirens	535	28.35%
Lights Only - No Sirens	48	2.54%
No Lights or Sirens	607	32.17%
Not Applicable	696	36.88%
Not Available	1	0.05%
<b>Total</b>	<b>1887</b>	<b>100.00%</b>
Response Disposition	#	%
Cancelled	230	11.73%
Cancelled - Out of Primary Service Area	1	0.05%
Cancelled - Request Transferred to Another Provider	5	0.25%
Dead at Scene	9	0.46%
No Patient Found	51	2.60%
No Treatment Required	180	9.18%
Patient Refused Care	255	13.00%
Standby Only - No Patient Contacts	39	1.99%
Treated and Released	39	1.99%
Treated, Transferred Care	34	1.73%
Treated, Transported by EMS	3	0.15%
Treated, Transported by EMS (ALS)	766	39.06%
Treated, Transported by EMS (BLS)	345	17.59%
Treated, Transported by Law Enforcement	1	0.05%
Treated, Transported by Private Vehicle	2	0.10%
Unable to Locate Patient/Scene	1	0.05%
<b>Total</b>	<b>1961</b>	<b>100.00%</b>
Response Request	#	%
911 Response (Scene)	1872	96.15%
Flagdown/Walk-in	10	0.51%
Flagdown/Walk-in Non-emergent	8	0.41%
Intercept	1	0.05%
Interfacility Transfer (Unscheduled)	17	0.87%
Medical Transport	1	0.05%
Mutual Aid	30	1.54%
Not Applicable	2	0.10%
Standby	6	0.31%
<b>Total</b>	<b>1947</b>	<b>100.00%</b>
Responding Unit	#	%
1FDXE45F31HA73883	89	4.52%
1FDXE45P33HA90625	279	14.18%
Car 2	1	0.05%
Engine 1	32	1.63%
Engine 2	42	2.14%
Engine 3	7	0.36%
Engine 5	1	0.05%
Medic 1	63	3.20%
Medic 2	176	8.95%
Medic 3	1273	64.72%
Not Applicable	1	0.05%
Not Available	1	0.05%
Rescue 1	1	0.05%
Truck 1	1	0.05%
<b>Total</b>	<b>1967</b>	<b>100.00%</b>

<b>Search Criteria</b>	
<b>Dates</b>	From 07/01/2007 To 06/30/2008
<b>Service</b>	Londonderry Fire Department
<b>Staff</b>	All
<b>Type of Service Requested</b>	All
<b>Patient Disposition</b>	All



Appendix C

First Name	Last Name	Title	Service Name	Address 1	City	State	Zip
JANIS L.	POWELL	HR MANAGER	AAVID FIRST RESPONDERS	67 PRIMROSE DRIVE	LACONIA	NH	03246
PATRICK	TWOMEY	PRESIDENT	ACCESS EMS, LLC	2 WHITNEY ROAD	CONCORD	NH	03301
ELBERT	KNICELY	CHIEF	ACWORTH VOLUNTEER FIRE & RESCUE COMPANY, INC.	PO BOX 86	ACWORTH	NH	03601
RACHEL	CLAYMAN	EMS COORDINATOR	ALEXANDRIA FIRE/RESCUE	158 WASHBURN ROAD	ALEXANDRIA	NH	03222
EVERETT	CHAPUT III	CHIEF	ALLENSTOWN FIRE DEPARTMENT	1 FERRY STREET	ALLENSTOWN	NH	03275
ANTON	ELBERS	CAPTAIN	ALSTEAD AMBULANCE	9 MAIN STREET	ALSTEAD	NH	03602
ALAN	JOHNSON	CHIEF	ALTON FIRE/RESCUE DEPARTMENT	PO BOX 472	ALTON	NH	03809
FRANK	KESLOF		AMERICAN MEDICAL RESPONSE	3 BOSTON WAY	NEWBURYPORT	MA	01950
REBECCA	JUSTICE	EXECUTIVE DIRECTOR	AMERICAN RED CROSS GREATER NASHUA & SOUHEGAN VALLEY	28 CONCORD STREET	NASHUA	NH	03064
BRIAN	GLEASON	DIRECTOR	AMHERST EMS	PO BOX 126	AMHERST	NH	03031
RICHARD	TODD	CHIEF	AMHERST FIRE DEPARTMENT	PO BOX 1199	AMHERST	NH	03031
PHIL	HACKMANN	PRESIDENT	ANDOVER RESCUE SQUAD, INC	PO BOX 209	ANDOVER	NH	03216
PATRICIA	LOVERING	DEP CHIEF	ANTRIM FIRE DEPARTMENT AMBULANCE	PO BOX 92	ANTRIM	NH	03440
ROGER	PACKARD	CHAIRMAN	ARCES ROGERS RANGERS INC	30 CRICKETT HILL ROAD	HARRISVILLE	NH	03450
BRADLEY	OBER	DEPUTY CHIEF	ASHLAND FIRE DEPARTMENT	PO BOX 856	ASHLAND	NH	03217
FRED	BECKWITH	EMS CAPTAIN	ATKINSON FIRE DEPARTMENT	PO BOX 6	ATKINSON	NH	03811
GEORGE	KRAUSE	CHIEF	BARNSTEAD FIRE-RESCUE	PO BOX 117	BARNSTEAD	NH	03225
ANTONIO	MAGGIO	CHIEF	BARRINGTON FIRE & RESCUE DEPARTMENT/EMS DIVISION	249 ROUTE 9	BARRINGTON	NH	03825
MICHAEL "RICK"	MURNIK	DIRECTOR	BARTLETT JACKSON EMERGENCY SERVICES	PO BOX 422	GLEN	NH	03838
MARK E.	KLOSE	CAPTAIN	BEDFORD FIRE DEPARTMENT	55 CONSTITUTION DRIVE	BEDFORD	NH	03110-
STEVEN H.	YOUNG	CHIEF	BEECHER FALLS VOLUNTEER FIRE DEPARTMENT, INC	PO BOX 367	W STEWARTSTOWN	NH	03597
JAMES	DAVIS	CHIEF	BELMONT FIRE DEPARTMENT	PO BOX 837	BELMONT	NH	03220
KRISTEN	JACKSON	RESCUE CAPT	BENNINGTON FIRE/RESCUE	8 SCHOOL STREET	BENNINGTON	NH	03442
CHRISTOPHER	DUBEY	MANAGER	BERLIN EMERGENCY MEDICAL SERVICES, INC	182 EAST MASON STREET	BERLIN	NH	03570
SCOTT	HODGKINS	PRESIDENT	BESTCARE AMBULANCE SERVICES INC	35 BEDFORD AVENUE	GILFORD	NH	03249
LAURA	LUCAS	ASST CHIEF	BETHLEHEM FIRE DEPARTMENT	PO BOX 189	BETHLEHEM	NH	03574
PETER	BOURGOINE	LT	BOW FIRE DEPARTMENT	10 GRANDVIEW ROAD	BOW	NH	03304
MARK	GOLDBERG	CHIEF	BRADFORD FIRE DEPARTMENT	PO BOX 203	BRADFORD	NH	03221
HEIDI	SALTUNAS	CAPTAIN	BRADFORD RESCUE SQUAD	PO BOX 381	BRADFORD	NH	03221
DONNA	VADEBONCOEUR		BRENTWOOD FIRE DEPARTMENT	148 CRAWLEY FALLS ROAD	BRENTWOOD	NH	03833
NORMAN	SKANTZE	CHIEF	BRISTOL FIRE DEPARTMENT	85 LAKE STREET	BRISTOL	NH	03222
WESLEY	WHITTIER	DIRECTOR	BROOKLINE AMBULANCE SERVICE	3 POST OFFICE DRIVE	BROOKLINE	NH	03033 0360
CHARLES	COREY, SR	CHIEF	BROOKLINE FIRE DEPARTMENT	PO BOX 660	BROOKLINE	NH	03033
DAVID	TOBINE	CHIEF	CAMPTON-THORNTON FIRE RESCUE	PO BOX 1258	CAMPTON	NH	03223
CAROL	GOODMAN	PRESIDENT	CANAAN FAST INC	PO BOX 35	CANAAN	NH	03741
RUDOLPH	CARTIER	CHIEF	CANDIA FIRE RESCUE	11 DEERFIELD ROAD	CANDIA	NH	03034
STEVE	MCPHERSON	EMS MANAGER	CANOBIE LAKE PARK CORPORATION	PO BOX 190	SALEM	NH	03079
JONATHAN	CAMIRE	LT	CANTERBURY FIRE & RESCUE	453 NORTHWEST ROAD	CANTERBURY	NH	03224
ERIC	DAMON	PRESIDENT	CARE PLUS AMBULANCE SERVICE, INC	PO BOX 685	MERRIMACK	NH	03054
ERIC	DAMON	PRESIDENT	CARE PLUS SEACOAST AMBULANCE SERVICE, INC	PO BOX 2154	MERRIMACK	NH	03054
RAYMOND	LEAVITT	ASST CHIEF	CENTER CONWAY FAST SQUAD	PO BOX 97	CENTER CONWAY	NH	03813
JOHN	SCHLEMMER	FIRE CHIEF	CENTER HARBOR FIRE RESCUE	PO BOX 222	CENTER HARBOR	NH	03266
MICHAEL	BROWNE	CHIEF	CENTER OSSIPEE FIRE & RESCUE	PO BOX 276	CTR OSSIPEE	NH	03814
ROBERT	CORMIER	COMMANDER	CENTRAL NH SPECIAL OPERATIONS UNIT	3785 DARTMOUTH COLLEGE HWY BOX 6	HAVERHILL	NH	03765
JERRY	BEAUDRY	DIRECTOR	CHARLESTOWN AMBULANCE SERVICE	PO BOX 369	CHARLESTOWN	NH	03603
GARY	STODDARD	FIRE CHIEF	CHARLESTOWN FIRE DEPARTMENT	PO BOX 304	CHARLESTOWN	NH	03603
RICH	ANTOINE	CHIEF	CHESTER FIRE DEPARTMENT	27 MURPHY DRIVE	CHESTER	NH	03036

STEVEN	BEVIS	CHIEF	CHESTERFIELD FIRE & RESCUE	492 ROUTE 63	CHESTERFIELD	NH	03443
GILBERT	VIEN	CHIEF	CHICHESTER FIRE-RESCUE	22 MAIN STREET	CHICHESTER	NH	03258
SCOTT	CLARENBACH	CHIEF	CITY OF FRANKLIN, NH FIRE DEPARTMENT	59 WEST BOW STREET	FRANKLIN	NH	03235
JEFFREY	MOREL	CAPT	CITY OF KEENE FIRE DEPT AMBULANCE SERVICE	32 VERNON STREET	KEENE	NH	03431
SHAWN	RILEY	DEPUTY CHIEF	CITY OF LACONIA FIRE DEPARTMENT	848 NORTH MAIN STREET	LACONIA	NH	03246
BRIAN	MORRISSEY	CHIEF	CITY OF NASHUA FIRE RESCUE	70 EAST HOLLIS STREET	NASHUA	NH	03060
STEVEN	ACHILLES	ASST CHIEF	CITY OF PORTSMOUTH FIRE DEPARTMENT	170 COURT STREET	PORTSMOUTH	NH	03801
PETER S	CHASE	CHIEF	CLAREMONT FIRE DEPARTMENT	100 BROAD STREET	CLAREMONT	NH	03743
BRETT	BROOKS	CHIEF	COLEBROOK FIRE DEPARTMENT	PO BOX 273	COLEBROOK	NH	03576
BRIAN	SALTMARSH	BUREAU CHIEF	CONCORD FIRE DEPARTMENT	24 HORSESHOE POND LANE	CONCORD	NH	03301
STEPHEN	SOLOMON	CHIEF	CONWAY FIRE DEPARTMENT	128 MAIN STREET	CONWAY	NH	03818
DALE	LAWRENCE	PRESIDENT	CORNISH RESCUE SQUAD	CLARK CAMP ROAD	CORNISH FLAT	NH	03746
SANDRA	BEARD		CROYDON FIRE & RESCUE	PO BOX 663	NEWPORT	NH	03773
THOMAS	AUSTIN	CHIEF	DANBURY VOLUNTEER FIRE DEPARTMENT	PO BOX 149	DANBURY	NH	03230
CHRISTOPHER	ROUSSEAU	CAMPUS SAFETY OFFICER	DANIEL WEBSTER COLLEGE EMS	20 UNIVERSITY DRIVE	NASHUA	NH	03063
ARTHUR	GRISWOLD	EMS CAPTAIN	DANVILLE FIRE DEPARTMENT	PO BOX 911	DANVILLE	NH	03819
JIAYI	HAO	DIRECTOR	DARTMOUTH EMS	DARTMOUTH COLLEGE HB 6083	HANOVER	NH	03755
FRANK CHRISTOPHER	ERDMAN	DIRECTOR	DARTMOUTH-HITCHCOCK ADVANCED RESPONSE TEAM	1 MEDICAL CENTER DRIVE	LEBANON	NH	03756
	GAMACHE	EMS CAPTAIN	DEERFIELD RESCUE SQUAD	PO BOX 9	DEERFIELD	NH	03037
ARNOLD	ANDERSON	CHIEF	DEERING FIRE & RESCUE	762 DEERING CENTER ROAD	DEERING	NH	03244
CHARLES	HEMEON	EMS DIRECTOR	DERRY FIRE DEPARTMENT	14 MANNING STREET	DERRY	NH	03038
RICHARD	DRISCOLL	ASST CHIEF	DOVER FIRE & RESCUE	288 CENTRAL AVENUE	DOVER	NH	03820
THOMAS	VANDERBILT	CHIEF	DUBLIN FIRE DEPARTMENT	PO BOX 370	DUBLIN	NH	03444
JONATHAN	WIGGIN	CHIEF	DUNBARTON FIRE DEPARTMENT	1011 SCHOOL STREET	DUNBARTON	NH	03046
CHARLES	MOORENOVICH	EMS COORDINATOR	DURHAM FIRE DEPARTMENT	51 COLLEGE ROAD	DURHAM	NH	03824
ANDREW	CONTI		EAST KINGSTON FIRE DEPARTMENT	PO BOX 171	EAST KINGSTON	NH	03827
JOHN	BURDETTE	CAPTAIN	EFFINGHAM FIRE DEPARTMENT RESCUE	1102 PROVINCE LAKE ROAD	EFFINGHAM	NH	03882
MICHAEL	MEHEGAN	CHIEF	ENFIELD FAST INC	PO BOX 345	ENFIELD	NH	03748
JOHN	CHILDS	EMS COORDINATOR	EPPING FIRE DEPARTMENT	37 PLEASANT STREET	EPPING	NH	03042
MATTHEW	MOULTON	CAPT	EPSOM FIRE & RESCUE	1714 DOVER ROAD	EPSOM	NH	03234
TERRI	RUEL		ERROL RESCUE SQUAD, INC	PO BOX 64	ERROL	NH	03579
ROSWELL	GALVIN	EMS COORDINATOR	EXETER FIRE DEPARTMENT	20 COURT STREET	EXETER	NH	03833
LAURA	THIBEAULT	EMS MANAGER	EXETER HOSPITAL PARAMEDIC INTERCEPT	5 ALUMNI DRIVE	EXETER	NH	03833
RICHARD	FOWLER JR	CHIEF	FARMINGTON FIRE RESCUE	381 MAIN STREET	FARMINGTON	NH	03835
NANCY	CARNEY		FITZWILLIAM FIRE DEPARTMENT AMBULANCE	PO BOX 725	FITZWILLIAM	NH	03447
BRYAN	GILLIKIN	DIRECTOR OF PUBLIC SAFETY	FOX RUN MALL E.M.S.	50 FOX RUN ROAD SUITE 128	NEWINGTON	NH	03801
DAVID	CONTI		FPLE - SEABROOK STATION	PO BOX 300	SEABROOK	NH	03874
KEVIN	HOLDREDGE	CAPTAIN	FRANCESTOWN VOLUNTEER FIRE DEPARTMENT	242 2ND NH TURNPIKE SOUTH	FRANCESTOWN	NH	03043
WILLIAM	MEAD SR	CHIEF	FRANCONIA LIFE SQUAD	PO BOX 900	FRANCONIA	NH	03580
LEE	POTTER		FRANKLIN PIERCE UNIVERSITY EMT SQUAD	40 UNIVERSITY DRIVE	RINDGE	NH	03461
ROBERT	CUNIO	CAPTAIAN	FREEDOM FIRE-RESCUE DEPARTMENT	PO BOX 386	FREEDOM	NH	03836
RICHARD	HAZELTON	FIRE CHIEF	FREMONT FIRE/RESCUE	425 MAIN STREET	FREMONT	NH	03044
JOHN	LEVITOW	DIRECTOR OF EMS	FRISBIE MEMORIAL HOSPITAL EMS	11 WHITEHALL ROAD	ROCHESTER	NH	03867
STEPHEN P.	GOLDSMITH	CHIEF	FRYEBURG RESCUE	PO BOX 177	FRYEBURG	ME	04037
JAMES	HAYES	CHIEF	GILFORD FIRE RESCUE DEPARTMENT	39 CHERRY VALLEY ROAD	GILFORD	NH	03249
TIMOTHY	ROBBINS	CHIEF	GILMANTON FIRE DEPARTMENT	PO BOX 128	GILMANTON IW	NH	03837
STEPHEN	ACKERMAN	CAPT	GILSUM VOL FIRE DEPT & RESCUE SQUAD	PO BOX 159	GILSUM	NH	03448
CHERYL	SCHARPING		GLOBAL RELIEF TECHNOLOGIES	30 NEW HAMPSHIRE AVE STE 2	PORTSMOUTH	NH	03801
STEVE	TOWER	CAPTAIN	GOFFSTOWN FIRE DEPARTMENT	18 CHURCH STREET	GOFFSTOWN	NH	03045

DALE	GIRARD	ADMINISTRATOR	GOLDEN CROSS AMBULANCE INC.	5 LINCOLN HEIGHTS	CLAREMONT	NH	03743
SCOTT	LANCASTER	DIRECTOR	GORHAM EMERGENCY MEDICAL SERVICE	347 MAIN STREET	GORHAM	NH	03581
CLARK	WAMSLEY	CAPT	GOSHEN RESCUE	MILL VILLAGE ROAD	GOSHEN	NH	03752
JANE	KENYON	CAPTAIN	GRAFTON VOLUNTEER AMBULANCE SERVICE	PO BOX 81	GRAFTON	NH	03240
STUART	GILLESPIE		GRANTHAM FAST	PO BOX 80	GRANTHAM	NH	03753
MOLLY	ANFUSO	RESCUE CHIEF	GREENFIELD FIRE & RESCUE DEPARTMENT	7 SAWMILL ROAD	GREENFIELD	NH	03047
MAURICE	SODINI	EMS COORD	GREENLAND VOLUNTEER FIRE DEPARTMENT	PO BOX 100	GREENLAND	NH	03840
LINDA	LEGERE	EMS CAPTAIN	GREENVILLE FIRE RESCUE DEPARTMENT	PO BOX 361	GREENVILLE	NH	03048
ALLAN	BRYANT	ADMINISTRATOR	GROVETON AMBULANCE	3 STATE STREET	GROVETON	NH	03582
TERRENCE	BEDELL	CHIEF	GROVETON FIRE PRECINCT	37 CHURCH STREET	GROVETON	NH	03582
PATRICK	MCGONAGLE	MANAGER	GUNSTOCK SAFETY SERVICE	PO BOX 1307	LACONIA	NH	03247
DIANE	VAILLANT	CAPTAIN	HAMPSTEAD FIRE RESCUE	17 LITTLES LANE	HAMPSTEAD	NH	03841
HY	HUBBARD		HAMPTON FALLS FIRE DEPARTMENT	3 DRINKWATER ROAD	HAMPTON FALLS	NH	03844
CHRISTOPHER	SILVER	DEPUTY CHIEF	HAMPTON FIRE DEPARTMENT	64 ASHWORTH AVENUE	HAMPTON	NH	03842
NEVAN P.	CASSIDY	CHIEF	HANCOCK FIRE DEPARTMENT	40 BENNINGTON ROAD	HANCOCK	NH	03449
ROGER	BRADLEY	CHIEF	HANOVER FIRE DEPARTMENT	48 LYME ROAD	HANOVER	NH	03755
WAYNE	DEROSIA	CHIEF	HARRISVILLE FIRE & RESCUE DEPARTMENT	699 CHESHAM ROAD	HARRISVILLE	NH	03450
SCOTT	COONEY	LT	HARTFORD FIRE DEPARTMENT	812 VA CUTOFF ROAD	WHITE RIVER JCT	VT	05001
MICHAEL	LAVOIE	CHIEF	HAVERHILL CORNER FIRE DEPARTMENT	PO BOX 66	HAVERHILL	NH	03765
LINDA	FISCHER	EMS CHIEF	HEBRON FIRE DEPARTMENT	PO BOX 37	HEBRON	NH	03241
THOMAS	FRENCH	CHIEF	HENNIKER RESCUE SQUAD	216 MAPLE STREET	HENNIKER	NH	03242
JOSH	MOREAU	PATROL DIRECTOR	HIGHLAND MOUNTAIN BIKE PARK PATROL	75 SKI HILL DRIVE	NORTHFIELD	NH	03276
MATTHEW	DESROCHERS	CHIEF	HILL FIRE DEPARTMENT	PO BOX 226	HILL	NH	03243
KENNETH	STAFFORD JR		HILLSBORO FIRE DEPARTMENT RESCUE	PO BOX 350	HILLSBORO	NH	03244
ELEANOR	MARDIN	CHIEF	HOLDERNESS FIRE/RESCUE	PO BOX 465	HOLDERNESS	NH	03245
RICHARD	TOWNE	CHIEF	HOLLIS FIRE DEPARTMENT	PO BOX 38	HOLLIS	NH	03049
MICHAEL	WILLIAMS	CHIEF	HOOKSETT FIRE-RESCUE DEPARTMENT	15 LEGENDS DRIVE	HOOKSETT	NH	03106
RICHARD	SCHAEFER	CHIEF	HOPKINTON FIRE DEPARTMENT	9 PINE STREET	CONTOOCOOK	NH	03229
MICHELLE	RUDOLPH		HUDSON FIRE DEPARTMENT	15 LIBRARY STREET	HUDSON	NH	03051
JASON	LAVOIE	Lt	HUDSON NEW HAMPSHIRE POLICE DEPARTMENT	1 CONSTITUTION DRIVE	HUDSON	NH	03051
JANET	WILLIAMSON	EMS COORDINATOR	HUGGINS HOSPITAL EMERGENCY DEPARTMENT	240 SOUTH MAIN STREET	WOLFEBORO	NH	03894
DAVID	CHAMBERLAIN	CHIEF	JAFFREY FIRE DEPARTMENT	10 GOODNOW STREET	JAFFREY	NH	03452
WILLIAM	GOREN	CHIEF	JAFFREY-RINDGE MEMORIAL AMBULANCE, INC	PO BOX 107	JAFFREY	NH	03452
CLAIRE	MATTIN	CAPTAIN	KENSINGTON FIRE DEPARTMENT	124 AMESBURY ROAD	KENSINGTON	NH	03833
CHRIS	HILTON	CHIEF	KER WESTERLUND AMBULANCE SERVICE	57 HIGH STREET	BRATTLEBORO	VT	05301
STEVEN	TURNER	EMS CAPTAIN	KINGSTON FIRE DEPARTMENT	PO BOX 302	KINGSTON	NH	03848
DOUGLAS	AIKEN	CHIEF	LAKES REGION MUTUAL FIRE AID	62 COMMUNICATIONS DRIVE	LACONIA	NH	03246
STEPHEN	JONES	CAPTAIN	LANCASTER FIRE DEPARTMENT	25 MAIN STREET	LANCASTER	NH	03584
GREG	CHAFFEE	CHIEF	LANGDON FIRE & RESCUE	126 NH RTE 12A	LANGDON	NH	03602
CHRISTOPHER	CHRISTOPOULOS	CHIEF	LEBANON FIRE DEPARTMENT	12 SOUTH PARK STREET	LEBANON	NH	03766-
MARTIN	CASTLE	LT	LEE FIRE & RESCUE DEPARTMENT	20 GEORGE BENNETT ROAD	LEE	NH	03824
GERALD	LEFEVRE	PRESIDENT	LEFEVRE AMBULANCE SERVICE	104 ATKINSON STREET	BELLOW FALLS	VT	05101
BARBARA	CHADWICK	LT	LEMPSTER FIRE DEPARTMENT	PO BOX 76	LEMPSTER	NH	03605
BARBARA	CHADWICK	CAPTAIN	LEMPSTER RESCUE	PO BOX 76	LEMPSTER	NH	03605
STACY	BOSSIE	DIRECTOR	LINWOOD AMBULANCE SERVICE	PO BOX 129	LINCOLN	NH	03251
JODY	GAGNON	DIRECTOR	LISBON LIFE SQUAD	PO BOX 205	LISBON	NH	03585
THOMAS B	SCHOFIELD	CHIEF	LITCHFIELD FIRE & RESCUE	257 CHARLES BANCROFT HWY	LITCHFIELD	NH	03052
JAMES	PINEO	LT	LITTLETON FIRE RESCUE	230 WEST MAIN STREET	LITTLETON	NH	03561
SEAN	CARROLL		LITTLETON REGIONAL HOSPITAL	600 ST JOHNSBURY ROAD	LITTLETON	NH	03561
DONALD	WALDRON	EMS COORDINATOR	LONDONDERRY FIRE DEPARTMENT	280 MAMMOTH ROAD	LONDONDERRY	NH	03053

ROGER	HAZLETT		LORD AMBULANCE SERVICE DBA LAKESIDE	PO BOX 490	CTR OSSIPEE	NH	03814
JEFFREY	BURR SR	CHIEF	LOUDON FIRE DEPARTMENT	PO BOX 7032	LOUDON	NH	03307
DEBBIE	LIVERNOIS	ED DIRECTOR	LRGHEALTHCARE EMERGENCY MEDICAL SERVICES	80 HIGHLAND STREET	LACONIA	NH	03246
DONNA	BROWN	PRESIDENT	LUNENBURG-GILMAN RESCUE	PO BOX 132	GILMAN	VT	05904
KEVIN	PETERSON	PRESIDENT	LYME FAST SQUAD	PO BOX 126	LYME	NH	03768
JAMES	COOGAN	CAPTAIN	MADISON FIRE & RESCUE	PO BOX 59	MADISON	NH	03849
NICHOLAS	CAMPASANO	DEPUTY CHIEF	MANCHESTER FIRE DEPARTMENT	100 MERRIMACK STREET	MANCHESTER	NH	03101
SGT JAMES	SOUCY		MANCHESTER POLICE DEPARTMENT SRT	351 CHESTNUT STREET	MANCHESTER	NH	03101
EMANUEL	LAGERBERG	CHIEF	MANCHESTER-BOSTON REGIONAL AIRPORT FIRE DEPARTMENT	402 KELLY AVENUE	MANCHESTER	NH	03103-3310
J ERIC	HOOD	CHIEF	MARL HARRIS FIRST AID & EMERGENCY SQUAD	PO BOX 399	MARLBOROUGH	NH	03455
LORETTA	HULL	CAPT	MARLOW VOL FIRE DEPARTMENT AMBULANCE	PO BOX 418	MARLOW	NH	03456
WESLEY	WHITTIER		MASON FIRE - EMS	101 DEPOT ROAD	MASON	NH	03048
PATRICK	AHEARN	PRESIDENT	MCGREGOR MEMORIAL EMS	47 COLLEGE ROAD	DURHAM	NH	03824
ROBERT	CROWELL	CHIEF	MEADOWOOD COUNTY AREA FIRE DEPARTMENT	PO BOX 599	FITZWILLIAM	NH	03447
ROBERT	CUNIO		MEDSTAR EMS INC	PO BOX 747	WEST OSSIPEE	NH	03890
ANTHONY	STOWERS	DEPUTY CHIEF	MERRIMACK FIRE RESCUE	432 DW HIGHWAY	MERRIMACK	NH	03054
ANDREA	BOWDEN		MIDDLETON FIRE & RESCUE	182 KINGS HIGHWAY	MIDDLETON	NH	03887
PETER	ROBERTS		MILAN & DUMMER AMBULANCE	PO BOX 185	MILAN	NH	03588-
ERIC	SCHELBERG	DIRECTOR	MILFORD AMBULANCE SERVICE	1 UNION SQUARE - TOWN HALL	MILFORD	NH	03055
JOHN	LUCIER	CHIEF	MILTON FIRE & RESCUE	PO BOX 588	MILTON	NH	03851
BOB	REGIS	SQUAD CHIEF	MONROE F.A.S.T. SQUAD	202 WOODSVILLE ROAD	MONROE	NH	03771
KEVIN	POMEROY	CHIEF	MONT VERNON FIRE DEPARTMENT	0 MAIN STREET	MONT VERNON	NH	03057
DAVID	BENGTSON	CHIEF	MOULTONBOROUGH FIRE RESCUE DEPARTMENT	PO BOX 446	MOULTONBOROUGH	NH	03254
RICHARD	LOTHROP	CHIEF	NELSON FIRE AND RESCUE	7 NELSON COMMON	NELSON	NH	03457
GINA	CATALANO	CAPTAIN	NEW BOSTON FIRE & RESCUE DEPARTMENT	PO BOX 350	NEW BOSTON	NH	03070
DAVID	BLANDING	CHIEF	NEW CASTLE FIRE DEPARTMENT	43 MAIN STREET	NEW CASTLE	NH	03854
KEVIN	JENCKES	EMS COORDINATOR	NEW DURHAM FIRE DEPARTMENT	PO BOX 207	NEW DURHAM	NH	03855
JOSEPH	LOMBARDO		NEW ENGLAND DRAGWAY, INC	ROUTE 27 BOX 1320	EPPING	NH	03042
CHRISTOPHER	MALLEY		NEW HAMPSHIRE CPR DBA CAPITAL EMS	497 HOOKSETT ROAD #2-224	MANCHESTER	NH	03104
DAVID	CLEMENT	CHIEF	NEW HAMPTON FIRE DEPARTMENT	PO BOX 368	NEW HAMPTON	NH	03256
MARY	FISH	EMS COORDINATOR	NEW IPSWICH FIRE DEPARTMENT	PO BOX 357	NEW IPSWICH	NH	03071
JASON	LYON	CHIEF	NEW LONDON FIRE DEPARTMENT	PO BOX 240	NEW LONDON	NH	03257
BENJAMIN	COON	SUPERVISOR	NEW LONDON HOSPITAL AMBULANCE SERVICE	273 COUNTY ROAD	NEW LONDON	NH	03257
PAMELA	DREWNIAK	CAPTAIN	NEWBURY FIRE DEPARTMENT	PO BOX 204	NEWBURY	NH	03255
CHRISTINE	WILSON	CAPTAIN	NEWFIELDS FIRE & RESCUE	PO BOX 300	NEWFIELDS	NH	03856
ROY	GREENLEAF III	CHIEF	NEWINGTON FIRE DEPARTMENT	80 FOX POINT ROAD	NEWINGTON	NH	03801-2718
RICHARD	MALASKY	CHIEF	NEWMARKET FIRE AND RESCUE	4 YOUNG LANE	NEWMARKET	NH	03857
BRIAN	TRACEY	EMS DIVISION CHIEF	NEWPORT FIRE-EMS	11 SUNAPEE STREET	NEWPORT	NH	03773
WILLIAM	INGALLS	CHIEF	NEWTON FIRE DEPARTMENT	PO BOX 209	NEWTON	NH	03858
VICKI	BLANCHARD	ALS COORDINATOR	NH FIRE ACADEMY EMERGENCY RESPONSE TEAM	98 SMOKEY BEAR BLVD	CONCORD	NH	03305
WILLIAM	RILEY	OPS MGR	NORTH CONWAY AMBULANCE INC	PO BOX 2787	NORTH CONWAY	NH	03860
SOLOMON	ROSMAN	CAPTAIN	NORTH CONWAY FIRE DEPARTMENT RESCUE SQUAD	PO BOX 218	NORTH CONWAY	NH	03860
THOMAS	LAMBERT	CHIEF	NORTH HAMPTON FIRE & RESCUE	235 ATLANTIC AVENUE	NORTH HAMPTON	NH	03862
MATTHEW	YEATMAN	DEPUTY	NORTH WALPOLE FIRE & RESCUE	70 CHURCH STREET	NORTH WALPOLE	NH	03609
KEVIN	MADISON	CAPT	NORTHWOOD FIRE/RESCUE	499 FIRST NH TURNPIKE	NORTHWOOD	NH	03261
JAYE	VILCHOCK	CHIEF	NOTTINGHAM FIRE-RESCUE	PO BOX 114	NOTTINGHAM	NH	03290
ARTHUR	DENNIS	CHIEF	ORFORD VOLUNTEER FIRE DEPARTMENT	ROUTE 10	ORFORD	NH	03777
ADAM	RILEY	CHIEF	OSSIPEE CORNER FIRE DEPARTMENT	PO BOX 415	OSSIPEE	NH	03864
MARC	CHAPPELL	CAPTAIN	PEASE FIRE & EMERGENCY SERVICES	302 NEWMARKET STREET	NEWINGTON	NH	03803-0157

HAROLD	PAULSEN	CHIEF	PEMBROKE FIRE DEPARTMENT	247 PEMBROKE STREET	PEMBROKE	NH	03275
RICHARD	OBERMAN	DIRECTOR	PENACOOK RESCUE SQUAD	PO BOX 6037	PENACOOK	NH	03303
BRIAN	WALL	DEP CHIEF	PETERBOROUGH FIRE AND RESCUE	16 SUMMER STREET	PETERBOROUGH	NH	03458
ELLEN	PUTNAM	CAPTAIN	PIERMONT FAST SQUAD	PO BOX 2	PIERMONT	NH	03779
DWAYNE	COVELL	CHIEF	PITTSBURG FIRE DEPARTMENT	1684 NORTH MAIN STREET	PITTSBURG	NH	03592
GARY	JOHNSON	CHIEF	PITTSFIELD FIRE DEPARTMENT & AMBULANCE	33 CATAMOUNT ROAD	PITTSFIELD	NH	03263
BRIAN	THIBEAULT	CHIEF	PLYMOUTH FIRE/RESCUE DEPARTMENT	42 HIGHLAND STREET	PLYMOUTH	NH	03264
BRIAN	TAPLEY	CHIEF	PORTSMOUTH NAVAL SHIPYARD FIRE & EMERGENCY SERVICES	CODE 1740 BLDG 29	PORTSMOUTH	NH	03804-5000
ROBERT	DILUZIO JR	ADMINISTRATOR	R J DILUZIO AMBULANCE SERVICE, LLC	PO BOX 692	KEENE	NH	03431-0692
BARBARA	ARNOLD		RANDOLPH LIFE SQUAD	130 DURAND ROAD	RANDOLPH	NH	03593
JOAN	ST JOHN	VICE PRESEIDENT	RAYMOND AMBULANCE, INC	1 SCRIBNER ROAD	RAYMOND	NH	03077
MARK	CONSIDINE	CHIEF	RESCUE INC	PO BOX 593	BRATTLEBORO	VT	05301
TERRI	O'RORKE	CAPT	RICHMOND VOL FIRE DEPT RESCUE SQUAD	17 WINCHESTER ROAD	RICHMOND	NH	03470
RICKARD	DONOVAN	CHIEF	RINDGE FIRE DEPARTMENT	PO BOX 163	RINDGE	NH	03461
NORMAN	SANBORN JR	CHIEF	ROCHESTER FIRE DEPARTMENT	37 WAKEFIELD STREET	ROCHESTER	NH	03867
CYNTHIA	GUIBONE	RN	ROCKINGHAM PARK AMBULANCE	PO BOX 47	SALEM	NH	03079
CHRISTOPHER	STAWASZ	EXEC DIR	ROCKINGHAM REG AMB, INC/NORTHEAST MEDICAL TRANSPORT	PO BOX 906	NASHUA	NH	03060
HARRY	KNOWLES	CHIEF	ROLLINSFORD FIRE DEPARTMENT	PO BOX 418	ROLLINSFORD	NH	03869
ADAM	SMITH	MANAGER	ROSS AMBULANCE SERVICE	PO BOX 632	LITTLETON	NH	03561
DEBRA	THOMPSON	DIRECTOR	RUMNEY EMERGENCY MEDICAL SERVICES	59 DEPOT STREET UNIT 2	RUMNEY	NH	03266
WILLIAM H CONSTANCE	SULLIVAN	CHIEF	RYE FIRE DEPARTMENT	555 WASHINGTON ROAD	RYE	NH	03870
	RICHARDS	DIRECTOR	SAINT ANSELM COLLEGE RESCUE TEAM	100 ST ANSELM DRIVE	MANCHESTER	NH	03102
LISA	WATERS	CAPTAIN	SALISBURY VOLUNTEER FIRE & RESCUE	PO BOX 100	SALISBURY	NH	03268
SHAWN	ALLEN	CAPTAIN	SANDOWN FIRE & RESCUE	PO BOX 1756	SANDOWN	NH	03873
SUSAN	MICHALSKI	CAPT	SANDWICH FIRE/RESCUE DEPARTMENT	23 WENTWORTH HILL	SANDWICH	NH	03227
JEFFREY	BROWN	CHIEF	SEABROOK FIRE DEPARTMENT	87 CENTENNIAL STREET	SEABROOK	NH	03874
SANDRA	HAYWARD	RN	SEABROOK GREYHOUND PARK	PO BOX 219	SEABROOK	NH	03874
GEORGE	CORRIVEAU	DIRECTOR	SHELBURNE FAST SQUAD	74 VILLAGE ROAD	SHELBURNE	NH	03581
BEVERLY L	FRIZZELL	DIRECTOR	SOLO RESCUE	PO BOX 3150	CONWAY	NH	03818
DONALD	MESSIER	CHIEF	SOMERSWORTH FIRE & RESCUE	195 MAPLE STREET	SOMERSWORTH	NH	03878
DAREL	OJA	CHIEF OP OFF	SOUHEGAN VALLEY AMBULANCE, INC	PO BOX 95	NEW IPSWICH	NH	03071
DOUGLAS	CUMMINGS	CHIEF	SOUTH BERWICK EMERGENCY AMBULANCE & RESCUE SERVICE, INC	PO BOX 157	SO. BERWICK	ME	03908
DAVID	MCELROY	DEP CHIEF	SOUTH HAMPTON FIRE/RESCUE	128 MAIN AVENUE	SOUTH HAMPTON	NH	03827
FRED	ROBERGE		SPECIAL TRANSIT SERVICE	180 ZACHARY ROAD	MANCHESTER	NH	03109
RICHARD	GIRARD	PRESIDENT	SPEEDWAY SAFETY SERVICE	5 LINCOLN HEIGHTS	CLAREMONT	NH	03743
STEPHEN	BUCKLEY JR	CHIEF	SPOFFORD FIRE & RESCUE	412 RT0UE 9A	SPOFFORD	NH	03462
JENNIFER	ROBERTS	CAPTAIN	SPRINGFIELD FIRE AND RESCUE	720 ROUTE 114	SPRINGFIELD	NH	03284
RUSSELL	THOMPSON	CHIEF	SPRINGFIELD VT FIRE DEPARTMENT AMBULANCE SVC	77 HARTNESS AVE	SPRINGFIELD	VT	05156
TODD	ROBINSON	PRESIDENT	STEWART'S AMBULANCE SERVICE, INC.	PO BOX 1399	MEREDITH	NH	03253
PATRICIA	LAMOTHE	FIRE CHIEF	STODDARD RESCUE	PO BOX 268	STODDARD	NH	03464
LOREN	PIERCE	CHIEF	STRAFFORD FIRE & RESCUE	PO BOX 25	CTR STRAFFORD	NH	03815
DERRICK	HALL	EMS CAPTAIN	STRATHAM FIRE DEPARTMENT	1 WINNICUIT ROAD	STRATHAM	NH	03885
NEIL A.	HENRY, JR	CHIEF	SULLIVAN FIRE & RESCUE DEPARTMENT	440 CENTRE STREET	SULLIVAN	NH	03445
THOMAS	PERRON	CAPT EMS	SUNAPEE FIRE EMS	PO BOX 15	SUNAPEE	NH	03782
JOHN	BERGLUND	CHIEF	SURRY VOLUNTEER FIRE DEPARTMENT	444 ROUTE 12A	SURRY	NH	03431
EDWINA	GRIMES	CHIEF	SUTTON RESCUE SQUAD	PO BOX 158	NORTH SUTTON	NH	03260
ROBERT	SYMONDS, JR	CHIEF	SWANZEY FIRE DEPARTMENT	PO BOX 10009	SWANZEY	NH	03446
CHRISTOPHER	ROBINSON	CAPT	TAMWORTH RESCUE SQUAD	PO BOX 271	TAMWORTH	NH	03886
MICHAEL	CONNOLLY	CHIEF	TEMPLE VOL FIRE DEPT EMERGENCY MEDICAL TEAM	PO BOX 80	TEMPLE	NH	03084
DAVID	EAST		THE NEW ENGLAND EMS INSTITUTE	1 ELLIOT WAY	MANCHESTER	NH	03103-3599
STEPHEN	CARRIER	CHIEF	TILTON-NORTHFIELD FIRE DEPARTMENT	12 CENTER STREET	TILTON	NH	03276

PAUL	BLAIS	EMS LT	TOWN OF AUBURN FIRE DEPARTMENT	6 PINGREE HILL ROAD	AUBURN	NH	03032
HOBART	HARMON		TOWN OF BRIDGEWATER FIRE-RESCUE-EMS DEPARTMENT	297 MAYHEW TURNPIKE	BRIDGEWATER	NH	03222
CHRISTOPHER	MILLIGAN	CHIEF	TOWN OF JEFFERSON DEPARTMENT OF EMERGENCY SERVICES	PO BOX 173	JEFFERSON	NH	03583
ROBERT	CHATEL	LT	TOWN OF PELHAM FIRE DEPARTMENT	PO BOX 321	PELHAM	NH	03076
JON	LOVETT	DEPUTY CHIEF	TOWN OF PLAISTOW FIRE DEPARTMENT	27 ELM STREET	PLAISTOW	NH	03865
MICHAEL	WALLACE	DEPUTY CHIEF	TOWN OF SALEM FIRE DEPARTMENT	152 MAIN STREET	SALEM	NH	03079
SCOTT	TAYLOR	DEPUTY CHIEF	TOWN OF SANBORNTON FIRE DEPARTMENT	PO BOX 112	SANBORNTON	NH	03269
NEWELL	BAILEY JR	CAPT	TOWN OF WEARE FIRE DEPARTMENT RESCUE	144 NORTH STARK HWY	WEARE	NH	03281
CARYLYN	MCENTEE	DIRECTOR	TOWN OF WILTON DBA WILTON-LYNDEBOROUGH-TEMPLE AMBULANCE SERVICE	404 FOREST ROAD	WILTON	NH	03086
THOMAS	MCPHERSON , JR	CHIEF	TOWN OF WINDHAM FIRE DEPARTMENT	PO BOX 120	WINDHAM	NH	03087
GARY	SEPE	VP	TRINITY EMS INC	PO BOX 187	LOWELL	MA	01853
MEGAN	SHAFFER	PRESIDENT	TRI-STATE AMBULANCE	34 RIVER ROAD	BOW	NH	03304
JOHN	LEVITOW	CHAIRMAN	TRI-TOWN VOLUNTEER EMERGENCY AMBULANCE	PO BOX 219	PEMBROKE	NH	03275
RONDA	FISH	CHIEF	TROY AMBULANCE INC	PO BOX 675	TROY	NH	03465
ADAM	THOMPSON	CHIEF	TUFTONBORO FIRE/RESCUE DEPARTMENT	PO BOX 437	MELVIN VILLAGE	NH	03850
JEFFREY	DUNCAN	CHIEF	TWIN MOUNTAIN AMBULANCE	PO BOX 119	TWIN MTN	NH	03595
ROSEMARY	HOMER	OWNER	TWIN RIVERS AMBULANCE TRANSFER SERVICES LLC	274 FOSTER POND ROAD	ALEXANDRIA	NH	03222
BRUCE	BAKER	CHIEF	UNITY VOLUNTEER FIRE DEPARTMENT	PO BOX 477	CLAREMONT	NH	03743
HARRY	BROWN		UPPER CONN VALLEY HOSPITAL - EMS	181 CORLISS LANE	COLEBROOK	NH	03576
JOHN	VOSE	ADMINISTRATOR	UPPER VALLEY AMBULANCE, INC	PO BOX 37	FAIRLEE	VT	05045
WILLIAM	RILEY	OPS MGR	VALLEY TRANSFER INC	PO BOX 2787	NORTH CONWAY	NH	03860
PATRICIA	BRACKETT		WAKEFIELD FIRE DEPARTMENT AMBULANCE	2017 WAKEFIELD ROAD	SANBORNVILLE	NH	03872
MARK	HOUGHTON	ASST CHIEF	WALPOLE FIRE-EMS	278 MAIN STREET	WALPOLE	NH	03608
SUSAN	GREENLAW	LT	WARNER FIRE & RESCUE	PO BOX 64	WARNER	NH	03278
BRIAN W	CLARK	PRESIDENT	WARREN-WENTWORTH AMBULANCE SERVICE	PO BOX 219	WARREN	NH	03279
STEVEN	MARSHALL	CHIEF	WASHINGTON POLICE DEPARTMENT	5 HALFMOON POND ROAD	WASHINGTON	NH	03280-3102
ROBERT	WRIGHT	CAPTAIN	WASHINGTON RESCUE SQUAD	PO BOX 233	WASHINGTON	NH	03280
CHRISTOPHER	HODGES	DIRECTOR	WATERVILLE VALLEY DEPARTMENT OF PUBLIC SAFETY	PO BOX 500	WATERVILLE VALLEY	NH	03215
MARJORIE	BLANCHETTE		WEBSTER FIRE DEPARTMENT	851 BATTLE STREET	WEBSTER	NH	03303
JAMES	SANTORELLO	EMS COORDINATOR	WEEKS MEDICAL CENTER PARAMEDIC INTERCEPT PROGRAM	173 MIDDLE STREET	LANCASTER	NH	03584
NOLA	BAYES	TRANSPORT MANAGER	WENTWORTH-DOUGLAS HOSPITAL TRANSPORT SERVICES	789 CENTRAL AVENUE	DOVER	NH	03820
BRADLEY	ELDRIDGE	CHIEF	WEST OSSIPEE FIRE RESCUE	PO BOX 122	WEST OSSIPEE	NH	03890
JOSEPH	COLLINS	COMMANDER	WESTERN NH SPECIAL OPERATIONS UNIT	BOX 27	NEWPORT	NH	03773
HARRY	NELSON	CHIEF	WESTMORELAND FIRE/ RESCUE DEPARTMENT	772 RT 63	WESTMORELAND	NH	03467
CHRISTOPHER	BUCHANAN	PATROL DIRECTOR	WHALEBACK MOUNTAIN PATROL	160 WHALEBACK ROAD	ENFIELD	NH	03748
JAMES	WATKINS	CHIEF	WHITEFIELD FIRE RESCUE DEPARTMENT	48 LITTLETON ROAD	WHITEFIELD	NH	03598
PETER	BURGHARDT	EMS CAPTAIN	WILMOT FAST SQUAD	PO BOX 33	WILMOT	NH	03287
DEBRA	FREEMAN	CAPTAIN	WINCHESTER FIRE DEPARTMENT AMBULANCE	6 PARKER STREET	WINCHESTER	NH	03470
TIMOTHY	LANG		WINDSOR FIRE DEPARTMENT	PO BOX 47	WINDSOR	VT	05089
PHILLIP	MORRILL JR	CHIEF	WOLFEBORO FIRE- RESCUE DEPARTMENT	PO BOX 629	WOLFEBORO	NH	03894
BRADLEY	KENNEDY	CHIEF	WOODSVILLE FIRE RESCUE	PO BOX 391	WOODSVILLE	NH	03785
STEPHEN	ROBBINS	DIRECTOR	WOODSVILLE RESCUE AMBULANCE	PO BOX 191	WOODSVILLE	NH	03785

Appendix D

**Call Determinant Survey**

Hello, my name is Don Waldron, I am the EMS Coordinator for the Londonderry, NH Fire Department. I am currently working on a research paper regarding the usage of call determinants for ambulance response modes. Please take a few moments to answer these questions and return this survey via the enclosed postage-paid envelope. Feel free to contact me at 432-1124 or dwaldron@londonderrynh.org if you have any questions.

Your help with this project is greatly appreciated.

**If you are a non-transporting, or non-emergency agency please indicate here & return:**

**Question 1:** *(please check only one selection)*

In your agency, how do ambulances respond to EMS calls received via E-911?

- All (or nearly all) responses utilize red lights and sirens (RLS)  Other
- Utilize E-911 call determinants to determine ambulance response mode (ie: respond with traffic or with RLS)

**Question 2:** *(check all that apply)*

How would you best characterize your agency's response area?

- Rural  Suburban  Urban

**Question 3:** *(please check only one selection)*

Does your dispatch center receive call determinant information (Alpha, Bravo, Charlie, Delta, Echo) before they dispatch your agency's ambulance to EMS calls received by E-911?

- Yes  No  Not known

**Question 4:** *(please check only one selection)*

Does your agency utilize call determinant information provided by E-911 to determine the type of response mode (ie: respond with traffic for alpha calls) for the ambulance?

- Yes  No, and have no plans to implement
- No, but planning to implement  No, but may consider in the future

**Question 5:** *(please check only one selection)*

If your agency utilizes call determinants (or has in the past) to determine the type of ambulance response mode, do you feel that this has ever adversely affected patient care?

- Yes  No  Not applicable  Prefer not to answer

**Question 6:** *(please check only one selection)*

Has your agency ever used call determinants in the past to determine ambulance response mode, but then abandoned the practice?

- Yes  No  Not applicable

**Question 7:** *(please check only one selection)*

Does your agency have any internal written policies regarding how ambulances are to respond to certain types of EMS calls?

- Yes  No

**Question 8:** *(please check only one selection)*

How do you feel about sending an ambulance "with traffic" to certain low-acuity EMS calls as determined by E-911?

- Agree  Disagree  No opinion

Please return to: Londonderry Fire Department, Attention: Don Waldron, 280 Mammoth Road, Londonderry, NH 03053

Appendix E

**New Hampshire EMS Call Determinant Survey Results**

Lt. Donald M. Waldron, Londonderry Fire Department

**Question 1:** (please check only one selection) 92 response

In your agency, how do ambulances respond to EMS calls received via E-911?

- 77.2% (71) All (or nearly all) responses utilize red lights and sirens (RLS)
- 19.6% (18) Utilize E-911 call determinants to determine ambulance response mode (ie: respond with traffic or with RLS)
- 3.3% (3) Other

**Question 2:** (check all that apply) 93 responses

How would you best characterize your agency's response area?

- 77.4% (72) Rural
- 15.1% (14) Suburban
- 3.2% (3) Urban

**Question 3:** (please check only one selection) 93 responses

Does your dispatch center receive call determinant information (Alpha, Bravo, Charlie, Delta, Echo) before they dispatch your agency's ambulance to EMS calls received by E-911?

- 77.4% (72) Yes
- 15.1% (14) No
- 7.5% (7) Not known

**Question 4:** (please check only one selection) 93 responses

Does your agency utilize call determinant information provided by E-911 to determine the type of response mode (ie: respond with traffic for alpha calls) for the ambulance?

- 34.4% (32) No, and have no plans to implement
- 32.3% (30) No, but may consider in the future
- 26.9% (25) Yes
- 6.5% (6) No, but planning to implement

**Question 5:** (please check only one selection) 88 responses

If your agency utilizes call determinants (or has in the past) to determine the type of ambulance response mode, do you feel that this has ever adversely affected patient care?

- 54.5% (48) Not applicable
- 35.2% (31) No
- 9.1% (8) Yes
- 1.1% (1) Prefer not to answer

**Question 6:** (please check only one selection) 93 responses

Has your agency ever used call determinants in the past to determine ambulance response mode, but then abandoned the practice?

- 72.0% (67) No
- 6.5% (6) Yes
- 21.5% (20) Not applicable

**Question 7:** (please check only one selection) 92 responses

Does your agency have any internal written policies regarding how ambulances are to respond to certain types of EMS calls?

- 55.4% (51) No
- 44.6% (41) Yes

**Question 8:** (please check only one selection) 91 responses

How do you feel about sending an ambulance "with traffic" to certain low-acuity EMS calls as determined by E-911?

- 51.6% (47) Agree
- 37.4% (34) Disagree
- 11.0% (10) No opinion



Appendix F

**Call Determinant Survey**

Please take a moment to complete this survey regarding how Londonderry Fire ambulances respond to EMS calls. Please return this survey to the EMS Office when complete. Your help with this project is greatly appreciated.

*Call determinants: When E-911 receives a call requesting an ambulance they ask the caller a series of questions in an attempt to determine the severity of the situation. Based on the answers, a call determinant code is assigned: A (alpha) for least serious (low-acuity) all the way up to E (echo) for the most serious call. This information is provided to local dispatch along with the nature of the call.*

**Question 1:** (please check only one selection)

How do you feel that the Londonderry Fire Department ambulances should respond to EMS calls?

- All (or nearly all) responses utilize red lights and sirens (RLS)  Other
- Utilize E-911 call determinants to determine ambulance response mode (ie: respond with traffic or with RLS)

**Question 2** (check all that apply)

Do you feel that ALL ambulance calls require a response utilizing red lights and siren?

- Yes  No  No opinion

**Question 3** (please check only one selection)

How do you rate the level of risk of personal injury that you are exposed to when responding to an EMS call utilizing red lights and siren?

- High  Moderate  Low or no risk

**Question 4** (please check only one selection)

Have you ever worked for an agency that utilized call determinant information provided by E-911 to determine the type of response mode (ie: respond with traffic for alpha calls) for the ambulance?

- Yes  No

**Question 5** (please check only one selection)

If you answered "Yes" to question 4, do you feel that this practice has ever adversely affected patient care?

- Not applicable  Yes  No  Prefer not to answer

**Question 6** (please check only one selection)

If you routinely work on a Londonderry Fire Department ambulance, approximately what percentage of your transports utilize red light and/or sirens during transport?

- 0% - 25%  25% - 50%  50% - 75%  75% - 100%  Not applicable

**Question 7** (please check only one selection)

To your knowledge, does the Londonderry Fire Department have any internal written policies regarding how ambulances are to respond to certain types of EMS calls?

- Yes  No

**Question 8** (please check only one selection)

How do you feel about sending an ambulance "with traffic" to certain low-acuity EMS calls as determined by E-911?

- Agree  Disagree  No opinion

Appendix G

**LFD Employee Call Determinant Survey Results**

Lt. Donald M. Waldron, Londonderry Fire Department

**Question 1:** (please check only one selection) 20 responses

How do you feel that the Londonderry Fire Department ambulances should respond to EMS calls?

- 40.0% (8) All (or nearly all) responses utilize red lights and sirens (RLS)
- 35.0% (7) Utilize E-911 call determinants to determine ambulance response mode (ie: respond with traffic or with RLS)
- 25.0% (5) Other

**Question 2:** (check all that apply) 20 responses

Do you feel that ALL ambulance calls require a response utilizing red lights and siren?

- 90.0% (18) No
- 10.0% (2) Yes
- 0.0% (0) No opinion

**Question 3:** (please check only one selection) 20 responses

How do you rate the level of risk of personal injury that you are exposed to when responding to an EMS call utilizing red lights and siren?

- 60.0% (12) Moderate
- 20.0% (4) High
- 20.0% (4) Low or no risk

**Question 4:** (please check only one selection) 20 responses

Have you ever worked for an agency that utilized call determinant information provided by E-911 to determine the type of response mode (ie: respond with traffic for alpha calls) for the ambulance?

- 90.0% (18) No
- 10.0% (2) Yes

**Question 5:** (please check only one selection) 11 responses

If you answered "Yes" to question 4, do you feel that this practice has ever adversely affected patient care?

- 81.8% (9) Not applicable
- 18.2% (2) No
- 0.0% (0) Yes
- 0.0% (0) Prefer not to answer

**Question 6:** (please check only one selection) 17 responses

If you routinely work on a Londonderry Fire Department ambulance, approximately what percentage of your transports utilize red light and/or sirens during transport?

- 35.3% (6) 25-50%
- 23.5% (4) 50-75%
- 23.5% (4) Not applicable
- 17.6% (3) 75-100%
- 0.0% (0) 0-25%

**Question 7:** (please check only one selection) 19 responses

To your knowledge, does the Londonderry Fire Department have any internal written policies regarding how ambulances are to respond to certain types of EMS calls?

- 84.2% (16) No
- 15.8% (3) Yes

**Question 8:** (please check only one selection) 19 responses

How do you feel about sending an ambulance "with traffic" to certain low-acuity EMS calls as determined by E-911?

- 47.4% (9) Agree
- 47.4% (9) Disagree
- 5.3% (1) No opinion

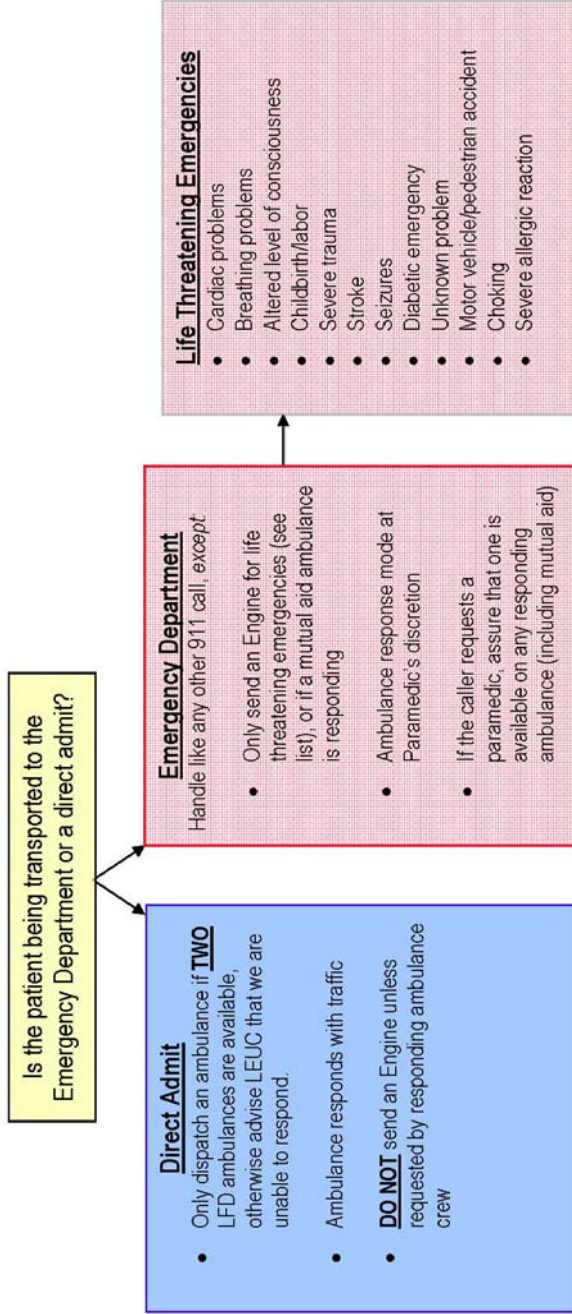
Appendix H

**Dispatch and Response Guidelines for Responding to 40 Buttrick Road**

**Phone: 552-1572**

- Response procedures for 40 Buttrick Road (non-Urgent Care) are the same as for any other office building in town.
- Response procedures for the **Elliot at Londonderry Urgent Care Center (LEUC)**  
 Caller to provide the following information:
  - Age
  - Gender
  - Chief Complaint
  - Destination
  - **Is the patient going to the Emergency Department or a direct admit?**
  - Is a paramedic required?

**Londonderry Elliot Urgent Care (LEUC) Response Decision Tree**



Appendix I

A Comparison of Londonderry Fire Department Alpha and Delta Triaged Medical Calls

<b>Transport disposition</b>	Alpha	Delta	Difference
Patient transported	80%	80%	0%
Patient not transported	20%	20%	0%
<b>Level of care provided by EMS personnel</b>			
ALS	66.70%	74.30%	11%
BLS	27%	20%	-25%
No treatments	6.70%	5.70%	-15%
<b>Primary impression of EMS Personnel</b>			
Abdominal pain	13.30%	0	
Allergic reaction	6.70%	2.90%	
Asthma	0.00%	2.90%	
Cancer	13.30%	2.90%	
Cardiac arrest	0.00%	2.90%	
Cardiac rhythm disturbance	0.00%	8.60%	
Chest pain	0.00%	5.70%	
CHF	0.00%	2.90%	
Dehydration	13.30%	0	
ETOH abuse	0.00%	2.90%	
Fever	0.00%	2.90%	
Hypoglycemia	0.00%	5.70%	
Nausea/vomiting	0.00%	2.90%	
Not known	0.00%	2.90%	
Pain	0.00%	5.70%	
Substance/drug abuse	0.00%	5.70%	
Syncopal/fainting	0.00%	5.70%	
Traumatic injury	13.30%	8.60%	
No apparent injury/illness	6.70%	8.60%	
Seizure	6.70%	2.90%	
Weakness	6.70%	17.10%	

<b>Patient status</b>			
Status 1	0.00%	2.90%	
Status 2	0.00%	0.00%	
Status 3	80.00%	74.30%	-7%
<b>Response mode</b>			
Red lights & siren	100%	100%	
Non-emergency	0%	0%	
<b>Average Response Time</b>			
	05:13	05:04	-3%
<b>Transport mode</b>			
Red lights & siren	26.70%	37.10%	39%
Non-emergency	53.30%	40%	-25%
Not transported	20	22.90%	-99%
<b>Treatments provided by EMS personnel</b>			
Oxygen	33.30%	51.40%	54%
EKG	26.70%	48.60%	82%
EKG-12 lead	13.30%	22.90%	72%
IV	60%	68.60%	14%
Medication	40%	37.10%	-7%
Other ALS	0%	1	

Derry Fire Department – Dispatch Procedures

Effective Date: June 30, 2008

Procedure No: **D6009**

Revision Date: June 30, 2010

Supersedes: n/a

Approved By: Lt. Brett Scholbe, Director

Signature: 

**Subject: EMD Response Priority Assignment**

Procedure for determining apparatus response based on EMD Call Determinants.

**Definitions:**

E911 Call: Request for service transferred from the E911 PSAP  
 Non-E911 Call: Request for service via **any** source other than E911; i.e. radio, radio box alarm, business line(s), Alarms Line, etc.

**Call Type Definitions:**

ALS Call: Requiring Medic Unit and Engine Company Assist  
 BLS Call: Medic Unit Response only  
 MVC Call: Requires MVC Run Card Response  
 Service Call: One Engine Response - No Lights or Siren

**1. Response Procedure – E911 Calls:**

(Applies to all Derry Fire Apparatus – other communities by local option)

- All emergency calls received via E911 will be dispatched and response based on EMD Determinants per the **Response Guideline Reference:**

**ALPHA:** Unit Responds No Lights or Siren / **Cold** (BLS Call)  
**BRAVO:** Unit(s) Respond with Lights and Siren / **Hot**  
 (ALS/BLS Call status is based on call determinant – for CAD Purposes, dispatched as an ALS Call Type)  
**CHARLIE:** Unit(s) Respond with Lights and Siren / **Hot** (ALS Call)  
**DELTA:** Unit(s) Respond with Lights and Siren / **Hot** (ALS Call)  
**ECHO:** Unit(s) Respond with Lights and Siren / **Hot** (ALS Call)  
**OMEGA:** No Response Recommended

- MVC Calls will receive a full MVC Response (Medic/Engine/Rescue Co.) per the CAD run card unless received as **no injuries reported**. The MVC Response level may be downgraded if additional credible information received (i.e. Medic unit or personnel on scene).
- Falls classified as **OMEGA** will continue to receive an Engine Company for lift assist as required.

**2. Response Procedure and Transfer of Non-E911 Calls to E911 for EMD/Pre-Arrival Instructions:**

- All calls received by sources other than the E911 lines (i.e. Business / Police / Alarms Lines) will initially be response coded at the **BRAVO** level with a Medic Unit and an Engine Company response.
- Once the Dispatcher has gathered all necessary response location information, the caller will be held on-line and the caller will be told that they will be transferred to E911 (603-271-8000) for EMD and pre-arrival instructions (This applies to calls where the caller is with patient /or is the patient and can answer ProQA questioning); The dispatcher will then release the phone call.
- The EMS call will be dispatched per the procedure;
- Response level may be upgraded at any time based on additional information received by dispatcher;
- Response level may only be downgraded if additional credible information is received (i.e. ProQA or Medic unit on scene).

**3. Radio Dispatching Procedure (example):**  
(Applies to Derry Fire and all contracted dispatch communities)

All EMS calls will be dispatched in the following radio format and information:

Initial Dispatch – Primary Response Information only:

- Responding Apparatus
- Location of Emergency
- Type of Emergency (Per EMD Category, or as given by Non-E911 Caller)
- Response Level (if given by EMD ProQA)

Radio Dispatch will be as follows (example):

*(tones)... "Derry Fire dispatching Auburn Fire and Derry Medic 3;  
357 Londonderry Turnpike;  
For chest pain;  
Delta Level".  
(repeat x1)  
(continue):  
"Grid A-3, Primary Street: Londonderry Turnpike;  
Time of Dispatch 1324 hours".*

After apparatus sign-on, the address confirmation and pertinent follow-up information (**age, sex, chief complaint** – reference Dispatch Procedure D6041) will be given to ALL responding units. (Directions and routing information also given as available).

Appendix K

Derry Fire Department – Dispatch Procedures

Effective Date: May 30, 2008

Procedure No: **D6044**

Revision Date: May 30, 2010

Supersedes: n/a

Approved By: Lt. Brett Scholbe, Director

Signature: 


**Subject: EMD CQI /FEEDBACK REQUEST PROCEDURE**

Any Department member may submit a request for a review of an E911 Call or EMD Determinant given by the Bureau of Emergency Communications (E911) for a given EMS call after consultation with their Battalion Chief.

Officers or Department members presenting issues directly to the Communications Center dispatchers will be referred back to their Supervisor or the Director of Communications.

Procedure for Requesting a review of an E911 EMD Call Determinant:

- Complete a written **NAEMD Field Feedback Report;**
  - Report must contain:
    - Reporting persons name,
    - Date and Time,
    - Dispatcher(s) on call,
    - Response Unit(s) on call,
    - and a detailed description of the Problem Encountered;
- Attach a printout of the **E911 ProQA Case Report;**
  - To Print Report:
    - On the Valor CAD Toolbar, select the **Prior Events** folder (third icon); this opens the Enterprise Studio Screen;
    - On the Enterprise Studio Screen, select (click) the Address / Call Info for the appropriate call in the scroll box, lower right;

- Click the **Reopen** button in upper right corner of the Studio screen; the E911 alert tone will sound and **Event Reopened Successfully** will display;
  - Click the **ProQA** tab in the lower Windows toolbar to reopen the ProQA window to view the EMD info;
  - On the ProQA window, click the **Printer**  icon to print case (icon located just above "DLS" tab);
  - Click **Print** in the Print Case Summary box;
  - Click the – button (upper right) to reduce the Enterprise Studio Window (do not close the Enterprise Studio);
  - On the Valor CAD Toolbar, select **Clear Events** (fourth icon), then click **Yes** to close the call info;
  - Valor CAD is now ready to receive the next E911 case.
- The person reporting will then submit the completed **NAEMD Field Feedback Report** and **E911 ProQA Case Report** to the Communications Director for submission to the EMS CQI Committee.
  - The EMS CQI Committee will review the call info supplied:
    - to determine if more information is needed, and request as required;
    - to determine if the Report should be submitted to E911 for QA Review.
  - Calls requiring E911 QA Review will be sent to the Communications Division for submission to the E911 Bureau.





# Field Feedback Report

Reported by: \_\_\_\_\_ Agency: \_\_\_\_\_  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_ Run #: \_\_\_\_\_ Unit(s): \_\_\_\_\_  
 Dispatchers: \_\_\_\_\_ and \_\_\_\_\_  
 Response Team: \_\_\_\_\_ and \_\_\_\_\_  
 Problem Encountered: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Specific Protocol referred to: \_\_\_\_\_ #: \_\_\_\_\_  
 Operating procedure referred to: \_\_\_\_\_ #: \_\_\_\_\_

=====  
**For QIU Use Only**  
 =====

Received at Quality Improvement Unit (Date): \_\_\_\_\_ By: \_\_\_\_\_  
 Investigation Outcome: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Case Review Completed (Date): \_\_\_\_\_ Compliance (%): \_\_\_\_\_ Correct Response Code: \_\_\_\_\_  
 Reported to: \_\_\_\_\_ at: \_\_\_\_\_  
 ED-Q's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Appendix L

Town of Derry Fire Department  
 Derry, New Hampshire  
 Standard Operating Guideline

SOG # 902.01	Date: May 30, 2008
Topic: Communications	Effective : June 1, 2008
Subject: <b>911 CALLS / EMD          FEEDBACK REQUESTS</b>	Revision Date:
Authorizing Signature:	Page 1 of 1

**PURPOSE:** The process to request a review of an E911 Call / EMD Determinant when discrepancies or problems occur with emergency response information given by the Bureau of Communications (E911) call center.

**SCOPE:** Applies to all Department Members

**PROCEDURE:** Any Department member may submit a request for a review of a Call or Determinant given by E911 for a given EMS call after consultation with their Battalion Chief or the Director of Communications.

To request a review of an E911 Call or EMD Call Determinant the person(s) requesting will:

- Complete a written **NAEMD Field Feedback Report** (available from the Communications Center and/or on the Intranet)
  - The completed report must contain:
    - Call Date and Time,
    - Reporting persons name(s),
    - Dispatcher(s) on call,
    - Response Unit(s) on call,
    - and a detailed description of the Problem Encountered;

Town of Derry Fire Department  
Derry, New Hampshire  
Standard Operating Guideline

- Attach a printout of the **E911 ProQA Case Report;**
  - The ProQA Case Report must be obtained from the Communications Center dispatcher; (refer to **Dispatch Procedure D6044**)
- Forward the complete report(s) to the Director of Communications for cursory review and forwarding to the EMS CQI Committee;
- The EMS CQI Committee will review the call along with appropriate EMS call records to determine if a problem did occur;
- If after review, the EMS CQI Committee determines further inquiry / E911 QA review is required, the report(s) and any other supporting documentation from the Committee will be returned to the Director of Communications for submission to the Bureau of Emergency Communications (E911) for their review and report.
- Pertinent feedback received from E911 will be returned the EMS CQI Committee with copies to the reporter(s).

Appendix M

**QI Summary Report**

<b>Agencies</b>	New Hampshire Emergency Comm
<b>View / Filter By...</b>	(Call Date >= '8/1/2008') AND (Call Date <= '8/31/2008')

Distribution: All Cases  
**Determinant      # of Cases Reviewed      % of Cases Reviewed      # of Cases Entered      % of Cases Entered**

OMEGA	3	0.70%	3	0.70%
ALPHA	61	14.15%	61	14.15%
BRAVO	64	14.85%	64	14.85%
CHARLIE	103	23.90%	103	23.90%
DELTA	189	43.85%	189	43.85%
ECHO	11	2.55%	11	2.55%

\* Total Cases Reviewed: 431  
 \* % Reviewed for Period: 7.22%

\* Total Cases Entered: 431  
 Call Volume: 5971

**Statistics:**

Protocol #	# of Cases	% Call Volume	Case Entry	Key Questions	PAIs	PDIs	Chief Comp.	Final Coding	Avg	Customer Service
1	12	0.20%	100.00%	100.00%	N/A	100.00%	97.25%	100.00%	99.45%	100.00%
2	11	0.18%	99.09%	96.00%	N/A	100.00%	100.00%	83.64%	95.75%	99.73%
4	3	0.05%	100.00%	100.00%	N/A	100.00%	100.00%	100.00%	100.00%	100.00%
5	13	0.22%	96.54%	98.15%	N/A	100.00%	84.54%	80.00%	91.85%	100.00%
6	85	1.42%	98.20%	98.58%	100.00%	98.77%	94.42%	98.82%	97.77%	99.71%
7	2	0.03%	100.00%	93.00%	N/A	100.00%	100.00%	100.00%	98.60%	100.00%
9	6	0.10%	100.00%	94.50%	87.50%	100.00%	100.00%	86.67%	94.57%	99.50%
10	44	0.74%	98.41%	98.86%	97.14%	100.00%	98.05%	100.00%	98.52%	100.00%
11	6	0.10%	98.33%	100.00%	72.50%	100.00%	93.33%	100.00%	93.93%	100.00%
12	17	0.28%	97.35%	98.82%	N/A	100.00%	100.00%	100.00%	99.24%	99.82%
13	9	0.15%	96.11%	100.00%	75.00%	100.00%	92.56%	100.00%	97.18%	100.00%
16	1	0.02%	100.00%	100.00%	N/A	100.00%	100.00%	100.00%	100.00%	100.00%
17	49	0.82%	99.08%	98.14%	N/A	100.00%	100.00%	100.00%	99.44%	99.80%
18	5	0.08%	96.00%	100.00%	N/A	100.00%	100.00%	100.00%	99.20%	100.00%
19	7	0.12%	94.29%	96.00%	N/A	100.00%	90.43%	91.43%	94.43%	100.00%
21	23	0.39%	100.00%	98.35%	N/A	100.00%	100.00%	95.65%	98.80%	100.00%
22	1	0.02%	100.00%	100.00%	N/A	100.00%	100.00%	100.00%	100.00%	100.00%
23	19	0.32%	94.58%	99.47%	100.00%	100.00%	98.95%	98.95%	98.39%	98.79%
24	1	0.02%	80.00%	100.00%	N/A	100.00%	100.00%	100.00%	96.00%	100.00%
25	11	0.18%	95.45%	97.27%	N/A	85.50%	93.91%	100.00%	94.43%	99.73%
26	33	0.55%	98.94%	100.00%	N/A	100.00%	93.91%	100.00%	98.57%	99.82%
28	9	0.15%	97.78%	99.11%	N/A	100.00%	100.00%	100.00%	99.38%	100.00%
29	17	0.28%	96.76%	98.12%	N/A	98.53%	97.35%	98.82%	97.92%	99.82%
30	17	0.28%	97.06%	98.24%	N/A	100.00%	86.41%	92.94%	94.93%	100.00%
31	29	0.49%	98.79%	98.28%	87.50%	97.60%	99.66%	95.86%	97.76%	99.79%
33	1	0.02%	100.00%	100.00%	N/A	N/A	100.00%	100.00%	100.00%	100.00%
<b>Totals</b>	<b>431</b>	<b>7.22%</b>	<b>98.05%</b>	<b>98.55%</b>	<b>94.08%</b>	<b>99.10%</b>	<b>96.42%</b>	<b>97.54%</b>	<b>97.79%</b>	<b>99.80%</b>

Appendix N

<b>EMERGENCY VECHICLE OPERATIONS – EMS RESPONSE</b>		<b>Londonderry Fire Department</b> <i>Operational Guideline</i>	
<b>EFFECTIVE DATE</b>	<b>REVISION DATE</b>	<b>NUMBER</b>	<b>PAGES</b>
PROPOSED	NONE	TBA	1

**OBJECTIVE:**

To utilize call determinant information provided by NH E-911 to determine an appropriate response mode for certain EMS calls thereby reducing risk to our employees, members of the public and our patients.

**APPLICABILITY:**

All personnel

**DEFINITIONS:**

Call determinant: A medical priority assigned to every request for an ambulance received by NH E-911 utilized a standards based prioritizing protocol. The determinants are from least to most serious: alpha, bravo, charlie, delta and echo. Omega call determinant is used when an ambulance response is not indicated.

**POLICY:**

1. When a request for an ambulance is received from E-911 the dispatcher shall obtain the call determinant code (alpha, bravo, charlie, delta, echo or omega) from E-911. This will generally be indicated on the Pro-QA screen.
2. The dispatcher shall dispatch appropriate apparatus in accordance with guidelines listed below.
3. Dispatcher shall advise responding units of any pertinent patient condition information or changes to call determinant as it becomes available.
4. A response mode may be upgraded when additional information warrants.

**Alpha call determinants**

- An engine and an ambulance shall be dispatched per appropriate SOG, after address and chief complaint information units should be advised “This is a cold response.”
- Units shall respond to alpha calls in a non-emergency mode, with traffic.
- Any alpha responses to the Londonderry Elliot Urgent Care (LEUC) shall receive an ambulance only response.

**Bravo, Charlie, Delta and Echo call determinants or no call determinant given**

- An engine and an ambulance shall be dispatched per dispatch standard operating guideline.
- Response to bravo, charlie, delta, echo and no call determinant calls shall be emergency mode.

<b>EMERGENCY VECHICLE OPERATIONS – EMS RESPONSE</b>		<b>Londonderry Fire Department</b> <i>Operational Guideline</i>	
<b>EFFECTIVE DATE</b>	<b>REVISION DATE</b>	<b>NUMBER</b>	<b>PAGES</b>
PROPOSED	NONE	TBA	1

**Omega call determinants**

- Omega calls generally do not require an ambulance response.
- Officer in charge may opt to respond apparatus to an omega call to check conditions as deemed warranted.
- Lift assist calls will receive one engine, unless it is known that a stair chair is required, then one ambulance shall respond.
- Apparatus responding to an Omega call shall respond in non-emergency mode, with traffic.

**Calls not received through E-911**

Other Public Safety Communication Centers/Airport Communications

- Obtain pertinent information
- Dispatch appropriate apparatus which shall respond in an emergency mode.
- When taking a request for a mutual aid ambulance response dispatcher shall ask for call determinant information. If response is for an alpha call the Londonderry ambulance shall be dispatched as a cold response and the requesting agency shall be notified of the response mode.

All other non-E-911 requests for an ambulance

- Dispatcher shall obtain necessary response location information, nature of call and call back information.
- Dispatch appropriate apparatus which will respond in an emergency mode.
- The dispatcher will transfer the call to E-911 so that proper pre-arrival instructions and prioritizing can occur.

Issued on the order of: \_\_\_\_\_ on \_\_\_\_\_ Date  
**Kevin MacCaffrie, Chief**