Back Injury Reduction in the Fire Department of New York Emergency Medical Service

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Abstract

The Fire Department of New York (FDNY) expends significant resources to compensate for the considerable number of back injuries that are incurred by its members of the Emergency Medical Service Command (EMSC). The problem is that the frequency of these injuries impacts the ability of the FDNY EMSC to perform in an efficient manner. The purpose of the research was to determine the most common causes for the back injuries that occur and recommend best practices to reduce them. The data that was reviewed confirms the frequency of reported back injuries but the quality of the data to determine the circumstances is vague and suspected to be less than accurate. Descriptive research was used to answer the questions: (a) what back injury prevention training is provided to newly hired members enrolled in the Training Orientation Program (TOP) at the FDNY EMS Academy, (b) what fitness requirements, if any, should be necessary for FDNY EMSC members once they have completed their basic training as newly hired employees, (c) what trends can be identified for the FDNY EMSC members who suffer from back injuries, and (d) how does the frequency of back injuries impact the FDNY EMSC? Procedures included interviews with subject matter experts with experience in physical fitness training, patient handling equipment selection, and workers compensation claims. The results of the procedures led the author to conclude that there needs to be better training, more efficient selection of the best ergonomic patient handling equipment, and comprehensive investigation practices regarding the circumstances of back injuries. The author recommends that fitness requirements be elevated for FDNY EMSC candidates, patient handling equipment selection be conducted in an efficient, structured manner, and that a safety officer is created to accurately investigate the circumstances of back injuries.

Table of Contents

Appendices

Back Injury Reduction in the Fire Department of New York Emergency Medical Service

Fire Department of New York Emergency Medical Service Command members often experience back injuries. The problem is that the frequency of back injuries impacts the ability of the FDNY EMSC to perform in an efficient manner. The curtailed or interrupted work life of an FDNY Emergency Medical Technician (EMT), Paramedic, or Officer has multiple consequences. The member injured to the point of being unable to perform their duties is sidelined to either light duty status or recuperating at home. Both of these conditions have a time limit of 18 months to either return to full duty status or vie for a disability pension and consequently, will preclude the member from earning overtime pay which many rely on to supplement their base salaries. The Department also suffers financially as these members who are eliminated from field duty must be replaced by others, who either volunteer or are ordered to perform overtime shifts. This stretching of staff is sometimes welcome by certain individuals to earn additional funds but eventually demoralizes members when they are routinely ordered to remain on duty past their scheduled tour. The initial purpose of this research was to identify the root causes for the back injuries suffered by EMTs, Paramedics, and Officers of the FDNY EMSC. Additionally, identifying means and methods to reduce these injuries became a compelling component and is included in this project.

Descriptive research was used to answer the following questions: (a) what back injury prevention training is provided to newly hired members while they are enrolled in the Training Orientation Program (TOP) at the FDNY EMS Academy, (b) what fitness requirements, if any, should be necessary for FDNY EMSC members once they have completed their basic training as

newly hired employees, (c) what trends can be identified for the FDNY EMSC members who suffer from back injuries, (d) how does the frequency of back injuries impact the FDNY EMSC?

Background and Significance

The FDNY has an EMSC workforce comprised of 3,324 uniformed members (Fire Department of New York, 2010). Over the last decade, annual on duty back injuries have peaked at 746 service connected incidents in the year 2010. The fewest service connected back injuries were reported in 2002 when a total of 299 back strain and sprains were recorded (Fire Department of New York, 2010). A review of FDNY data over an 11 year period (2000-2010) revealed that on duty incidents of reported back strains or sprains have averaged 491 injuries annually. Considering that each injury results in a variance of lost staffing, the impact these injuries have had on the ability of the FDNY EMSC to operate efficiently in the past and in the future is a serious problem. Back injuries invariably also require some level of medical attention either by FDNY physicians, or a member's personal physician, or both. Consequently, there is a significant financial impact on New York City, incurred both directly and indirectly by the FDNY. Directly, the FDNY is financially affected by the loss of production while the injured worker is incapable of performing their duties, the overtime wages spent to replace that worker, and the medical as well as the litigation costs incurred. Indirectly, funds that are dedicated to the effort to reduce these injuries through training in proper lifting and handling techniques, and the testing and purchasing of more ergonomic patient carrying equipment must be spent wisely and strategically. Reduction of the frequency of this type of injury is essential to the efficient operation of the FDNY as it struggles to meet budget constraints imposed by City Hall, without reducing essential life saving services.

Training for new recruits at the FDNY EMS Academy has historically included components on the proper techniques for lifting and carrying both patients and equipment. During the Training Orientation Program (TOP) recruits are required to engage in strategic physical exercise to strengthen their core muscles. Recruits are also afforded classes detailing and encouraging optimal nutrition.

In the Executive Development course, Executive Fire Officers are taught to recognize circumstances that adversely affect the ability of their Department to effectively achieve its mission and to exercise leadership to improve those circumstances. Identifying effective means to reduce the frequency of EMS worker back injuries will essentially enhance the capacity of any EMS system to better provide the necessary personnel for an emergency response. The ability of the FDNY to be well prepared to respond to all types of natural and man-made disasters is dependent on maintaining adequate, if not robust, staffing levels. Over the past 10 years there has been only 1 significant change to the equipment being used by the FDNY EMSC for handling patients, that being the upgrade to the 1 ½ rescuer stretcher or gurney. Improving the capacity of the FDNY to adapt to specific circumstances and change in a timely manner is addressed in Unit 3 in the Executive Fire Officer's Program Executive Development Course, which emphasizes structural models to affect change (National Fire Academy, 2006). To accomplish the United States Fire Administration's (USFA) goal number 3, which is to improve our capability to respond and recover from all hazards, the FDNY is obligated to advocate for a culture of health, fitness, and behavior that enhances emergency responder safety and reduces injuries for its members (United States Fire Administration, 2010).

Literature Review

A literature review was conducted to determine the relative frequency, most prevalent causes, and the efforts to reduce back injuries suffered by EMS workers. Comparative data was sought from national statistics as well as the London Ambulance Service to determine how back injuries reported by the FDNY EMSC contrasted with other EMS systems. Two strategic interviews were conducted with selected members of the FDNY to discover what equipment and methods were currently employed to help to minimize back injuries. Mr. Gregg Burzine of the FDNY Medical Equipment Unit reviewed EMS equipment initiatives. Lieutenant David Russell of the EMS Academy discussed targeted training programs designed for new recruits. Another interview was conducted with Deputy Chief Jay Swithers of the FDNY's Bureau of Health Services, whose years of experience and observations contributed to his educated opinions. The information from these interviews will be presented in the Results section. The information gathered from the literature review and the aforementioned interviews would help to determine the frequency and the depth of the impact that back injuries have on the EMS workforce as well as determine the most viable methods to attempt to minimize them.

The National Association of Emergency Medical Technicians (NAEMT) surveyed EMS population segments to identify what percentage of a sampling of EMS workers were actually injured and what component of that group suffered back injuries (jointly commissioned by NAEMT and Mc Neil Consumer & Specialty Pharmaceuticals June/July 2005). This article originally posted in EMS World Magazine on November 19, 2005 reviewed the findings of the NAEMT survey which revealed that four of five EMS workers report some sort of injury or

illness that is directly resulting from their work. Of the 1,356 NAEMT members who participated in the survey, 47% reported sustaining a back injury while performing EMS duties.

Comparatively, since the year 2000, the FDNY EMSC has recorded more back sprains or strains than any other injury totaling 5,534 reported cases (FDNY 2010). As a comparative example, all service connected orthopedic injuries combined totaled 2,806 for the 11 years since 2000. Reported contusions, to any part of the body, totaled 1,106 for the same 11 year span. The only other service connected injury that rivaled the back injury was that of shoulder sprains and strains, which totaled less than half with 2,093 reported cases (see Appendix G for comparison). All service connected maladies, including service connected illnesses, totaled 21,277 since the year 2000. Data reflected that reports of back sprains and strains accounted for over 26% of these service connected illnesses and injuries. Additional FDNY data revealed that for those 3,808 service connected back injuries that resulted in any loss of time while recuperating, more than 75%, or 2,868, were classified as “lifting and handling” injuries (FDNY, 2010). This classification includes lifting and handling both patients and equipment.

Reducing these injuries requires a multi-pronged approach. The EMS worker must more readily accept some responsibility for their personal fitness and preparedness to perform their routine daily duties. Having the best equipment and proper training in how to use it correctly is another critical element to reducing back injuries. In an article published in JEMS (Dailey 2010) featured in the Health and Safety section, the author reviewed the impacts that affect the employer and the employee alike when an on the job musculoskeletal injury is sustained resulting in time lost at work. The investment that an employer makes for that injured employee suddenly yields no returns once that employee is unable to report and perform their function.

Then there are the medical costs of evaluation, ongoing care, rehabilitation, light duty time, retraining, shift replacement and consequently poor morale. Dailey refers to National Safety Council (NSC) statistics to report that back pain is the most common cause of disability for all people younger than 45 years of age. According to the NSC, 93 million workdays are lost annually in the United States due to back pain, at an estimated cost of 30 to 50 billion dollars per year. The International Association of Firefighters' (IAF) annual Death and Injury Survey revealed that back injuries account for approximately 50% of all line of duty retirements each year. Personal efforts to reduce the likelihood of an injury should include smoking cessation, weight management, proper posture, adequate sleep, sufficient hydration, and good nutrition.

The primary recommendation that Dailey makes in her article is the creation of an effective injury prevention program. To reduce injuries in general, particularly the increasingly prevalent back injury, a well thought out Musculoskeletal Injury Prevention Program (MSIPP) must be instituted. Daley emphasizes that the keys to its success are the commitment and cooperation of staff, administration, and union representatives. Conducting positive and proactive investigations into previous job related injuries is another component of the MSIPP. Determining whether safety regulations were followed or if the proper equipment was used, or even available, is a large part of the investigative process. Most importantly, for the investigation to be effective it must not turn into an unproductive fault finding expedition. Identifying procedural flaws in an injury incident will be fundamental to developing new methods and policies that will reduce the possibility of future similar occurrences.

Ongoing training and education was a cornerstone of Dailey's conclusion in her article. Not only should new employees receive training, but presentations to educate and reinforce

proper body mechanics should be conducted periodically throughout each year. Despite the best of training, a strong, lean, flexible musculoskeletal system is critical to the successful reduction of back injuries. The nature of EMS work will invariably put a worker in an awkward position that does not allow for the best support of the body's structural integrity.

To further quantify the impact of injuries incurred, a review of the direct and indirect costs of firefighter injuries was performed. Lost wages that exceed disability payments, overtime wages, disability pensions, and litigation costs are the obvious, direct costs of any injury. Providing initial care, personal protective equipment, administrative costs for insurance, safety technology, and training and personnel, are some of the less obvious indirect costs of an injury. The complexity of determining an exact dollar amount for any type of injury makes the accuracy of any estimates questionable (National Institute of Standards and Technology, 2004).

Comparison of the equipment used by EMTs and Paramedics was another significant component of injury reduction research. Considering that the most likely circumstances leading to back related injuries involves the lifting and handling of patients, studies that analyzed the overall efficiency of different gurneys and stair chairs were reviewed. In one study on the impact of gurney design on EMS personnel (Fredericks, Butt, and Hovenkamp 2009), the means to measure the most preferable device was through the measurement of the financial impact on a specific ambulance service. This impact was primarily measured by the cost of employees claiming injury and subsequent days in which these injured employees were unable to perform their duties. There were only two different gurneys tested with the significant difference being that one was ergonomically enhanced through being equipped with a battery powered motor to raise and lower the patient laden gurney. Initially, for a two year period, from March 2004

through February 2006, this subject ambulance service utilized a manual gurney made by a nationally renowned equipment company. In March 2006, this model was updated to a battery powered gurney that was produced by the same nationally renowned company. During the subsequent two years following the upgrade, comparative data was collected specific to gurney related injuries. During the two year period prior to introduction of the new gurney, there were 208 lost work days and 478 restricted work days incurred in gurney related incidents. Following the installation of the new gurney design, lost work days fell to 66 and restricted days to 278, a 68% decrease and 42% decrease, respectively. During that same time period injury claim totals were reduced from $88,453 to $51,870, a decrease of 41%. One intriguing element of this study was that there was an increased frequency of incidents of injury loading the gurney into the ambulance during the first month following the installation. It was revealed that 52% of the costs associated with injuries incurred while loading the gurney occurred during that first month. Follow up interviews of the study subjects revealed that this could be attributed to not following the manufacturer's guidelines for this process, which indicated that two EMS personnel were required to load the gurney and in most cases the gurney was being loaded by only one. The concept that the reduction of task demands on an EMS employee will result in the realization of a positive financial impact was a significant conclusion to this study.

One concern that has been published regarding the overall effectiveness of the motorized gurney in the pre-hospital setting is the weight that is added by the motor and batteries. The problem cited is that the weight of the gurney may dissuade the EMS worker from appropriately bringing the device to the patient's side and consequently result in a patient walking to the ambulance that should be carried (Dick, JEMS). Another issue noted in this article is that the

manufacturers of this type of equipment are too far removed from the realistic use of the item to recognize the shortcomings the added weight creates.

Stair-chairs are another piece of patient moving equipment that is frequently used by the EMS worker. In research that analyzed the biomechanics of paramedics using stair-chairs, comparisons of compression forces on the lower back were studied during the process of carrying a patient down multiple flights of stairs using different devices and carrying techniques. Posture of the paramedics during the carrying process was reviewed using multiple video cameras. Degrees of forward bending, side bending, and twisting were determined to affect the compression forces on the lower back. Maneuverability of the chair on tight landings was also considered a factor that could affect the likelihood of sustaining a back injury. Stair-chairs that allowed the leader to descend the stairs facing forward were found to reduce the biomechanical loads placed on that individual (Fredericks, Choi, Butt, and Kumar).

In addition to carrying a patient, transfer of a patient from one carrying device to another can put an EMS worker in jeopardy. Innovations being reviewed to reduce the likelihood of injury in this setting include slick low friction transfer aids such as the Speed-Sheet from Stryker which, when activated, creates a slippery surface to slide a patient from an ambulance stretcher to a hospital bed (January 2011 EMS World).

An Ohio State University research article evaluates the frequency that EMTs and paramedics miss work due to a work related injury (Caldwell). Emergency responders are nearly eight times more likely to miss work due to an injury or illness than the national average according to data compiled by the U.S. Bureau of Labor Statistics in 2006. Data analyzed in this research connected a high call volume and a history of recent back problems to a greater

possibility of injury for EMTs and paramedics. EMS professionals are most likely to incur injury from inadvertent needle sticks, violence from a patient, traffic accidents, and musculoskeletal injury from lifting and moving patients. Working in an urban environment where the population exceeds 25,000 results in the three times the likelihood of a work related injury being reported in comparison to those EMS workers in a rural area. The research was driven to evaluate the effectiveness and the tendency to purchase and use new devices designed to reduce back injury, such as stretchers with hydraulic lifts and specialized chairs that ease the movement of patients on stairs. Although this equipment comes with an increased cost it can certainly save a back which in the long run can be considerably more expensive.

The NSC provides research studies on injuries that occur in all occupations. They report that bricklayers have the highest rate of back injuries in the construction industry. This occupation is characterized by constant repetitive lifting of masonry units; up to 200 units weighing at least 38 pounds each day. The prevalence of smaller private contractors employing bricklayers was determined to be responsible for the lack of products, equipment and work practices geared toward the reduction of injuries. A survey that was conducted amongst masonry contractors found that safety ranked third among reasons for using an intervention behind time savings and increased productivity.

Another critical element affecting back injuries is the prevalence of obesity in our population. This affects the EMS worker in two specific ways. As the EMS worker is part of this population, consideration must be given to the concept that the worker may certainly meet the criteria for obesity. Additionally, the subject population that many times must be handled, lifted and carried may in fact meet these same criteria for obesity. One could certainly conclude

that the obese population would, in fact, be more likely to require the services of the EMS worker than those that do not meet that criterion. In an article published in the Journal of American Medicine (JAMA January 20, 2010) it was determined that the prevalence of obesity in the United States remains high, exceeding 30% in nearly all sex and age groups and that there has been an increase of 4.7 percentage points for all men between the years 1999 and 2008 (Flegal, Carrol, Ogden, Curtin). In Massachusetts, the Boston Globe newspaper reported that the Boston Emergency Medical Service began deploying an ambulance with a hydraulic rear lift to assist in the transport of obese patients. The ambulance retrofitting cost is approximately $12,000 and the reinforced stretcher, capable of shouldering 850 pounds, comes with a price tag of $8,000. The retrofitted ambulance, designed to lift the obese patient and stretcher into the rear of the ambulance, will be specially assigned when requested for an excessively heavy patient. Of course the EMS crews still must get the patient out of the house and should the patient be in a life threatening condition, they may not wait for the specialty ambulance to arrive at all (Smith 2011).

A March 2010 report released by the National Institute for Occupational Safety and Health evaluated injuries and illnesses in the wholesale and retail trade industries (Claussen). The report determined that these types of occupations were not as free from injury and illness as was expected before the data was reviewed. Musculoskeletal disorders were determined to be one of the primary injury risks for retail workers and lifting was the most likely cause. Although proper training was identified as a significant component to reduce the risk of incurring injuries it does not take the place of proper workplace design and work practices. An emphasis on productivity and getting a task done in the shortest amount of time enhances the likelihood that safety will not be the priority in a profit driven, competitive environment.

In summary the literature reviewed revealed that back injuries occur more frequently in any occupation that involves repetitive lifting of relatively heavy objects. Having to perform this task under duress with limited time constraints only adds to the likelihood that an injury will occur. When the object being lifted is not evenly weighted and has the capacity to shift and change the dynamics of the load during a lift it would seem that an injury is nearly unavoidable. Add to this the concept of a variable environment with multiple obstacles and challenges and you have a recipe for back pain. Despite the obvious cost effectiveness of investing in definitive methods to reduce these injuries it is rarely given the attention it deserves. EMS systems continue to have difficulty gathering useful, accurate data to determine the most effective course of action to address this costly, very prevalent type of injury.

Procedures

Descriptive research was the method used to investigate and recommend methods to reduce the likelihood of incurring a back injury while performing the duties of an EMS worker. A questionnaire was used to gather a sampling of feedback from the EMS workers assigned to FDNY EMS Division-4, which is synonymous with the Borough of Queens. Three interviews were conducted from selected subject matter experts employed by the FDNY.

The questionnaire was developed using a pay for use questionnaire builder site on the Internet. The service used was Survey Monkey at surveymonkey.com. The questionnaire was anonymous and compliance with completing the questionnaire was optional during the member's free time. The questions were primarily closed ended with two of the eight questions having open ended options. A cover letter was sent to each of the six Queens ambulance stations as well as to each of the station's Commanding Officers, requesting their participation. From a

population of approximately 500, only 77members, or 15%, actually completed the online questionnaire despite follow up e-mails. The inability to compel the members to complete the questionnaire was a limitation although the data gathered from those that participated was deemed to be consistent with other research and therefore, useful.

The Health and Fitness Training Officer of the EMS Academy, Lieutenant David Russell, was interviewed in person on December 17, 2010, at 3:30pm in his office on the Fort Totten campus in Queens, New York. A series of questions were asked to help determine what enhancements had been implemented in the basic training of newly hired recruits and any subjective observations he may have had regarding the general health and fitness of those recruits.

The Director of the FDNY's Medical Equipment Unit (MEU), Mr. Gregg Burzine, was interviewed in person on December 21, 2010, at 3:00pm in his office at the MEU located in Sunnyside Queens, New York. The questions posed to Mr. Burzine were chosen to elicit feedback concerning the overall improvement of the equipment purchased for the movement of patients in recent years, and the process that coincided with that equipments' selection.

Additionally, an interview was conducted in person with Deputy Chief Jay Swithers. Deputy Chief Swithers is the Director of Workers Compensation Claims and is assigned to the FDNY's Bureau of Health Services located at FDNY Headquarters at 9 Metro Tech Center in Brooklyn New York. I interviewed Deputy Chief Swithers on February 9, 2011, at 12:30 pm in his FDNY Headquarters' office. The intended purpose of this interview was to solicit his expert opinion and to identify any trends that he may have observed in the occurrence of back injuries during his years of experience. An unexpected derivative from this interview was the revelation

of the limitations of the methods currently used to gather data regarding these injuries and how that flaw may affect the ability of the FDNY to effectively reduce these injuries.

Finally, to obtain comparative information from a service that has similar resources and call volumes of the FDNY EMSC, I contacted the London Ambulance Service. This interview was conducted via e-mail with four different questions being answered by different members of the London Ambulance Service that were deemed best suited to reply.

Results

Upon initial consideration of the problem of the prevalence of back injuries for the EMS worker it is apparent that the importance of physical fitness is paramount. The conversation with Lieutenant David Russell of the EMS Academy affirmed that there is an emphasis on being physically prepared to perform the manual duties that encompass EMS work during a recruit's initial training. New FDNY EMSC recruits that are enrolled in the Training Orientation Program (TOP) are afforded many hours of physical training by participating in calisthenics, aerobics, and light weight training during their eight week program. These recruits are also trained and practiced in the most ergonomically correct methods to lift and carry both patients and equipment. Stricter screening parameters have also resulted in the hiring of candidates that must meet specific height and weight parameters. In Lieutenant Russell's educated opinion, the overall fitness of these recruits is still poor. They invariably improve their fitness during the program, but once the eight week TOP class is completed there is little, if any emphasis placed on maintaining their improved physical state. Any additional mandated physical requirements of employment would certainly be subject to contractual negotiation with the unions and is not currently a viable consideration for the FDNY.

The results from the respondents to the online questionnaire were concurrent with much of the information that was gathered from the literature review. The majority of the respondents were members that had an excess of 11 years of employment with the FDNY EMSC (83%). A total of 74% of the respondents reported that at some time during their employment they incurred a service connected injury that resulted in back pain. Of those, 62% reported that some work time was missed due to their injury. For the majority the amount of time lost from work was relatively short with 75% reporting that they were unable to work for less than one month and more than half of that group being out of work for less than one week. Patient handling drew the majority of responses for the causative factor to the reported back injuries. Physical fitness, poor lifting techniques, patient obesity, and patient movement were among the majority of the contributing factors leading to members hurting their backs. Suggestions from the participants included improving the fitness standards for FDNY EMSC members, purchasing lighter, more ergonomically designed equipment, and better, more consistent training in proper lifting techniques.

The literature that was reviewed revealed that the most common factor for occupations that incurred a considerable frequency of back injuries was repetitive lifting of heavy objects. EMTs and paramedics that work in urban areas have an increased possibility of incurring any type of injury and those that experience high call volume have a greater possibility of specifically suffering a back injury. Additionally, once an EMT or a paramedic has injured their back the likelihood of incurring another back injury is increased (Caldwell). Better fitness and advanced equipment were the consistent recommendations throughout the literature.

The national obesity epidemic is also a proven significant element of the prevalence of EMS worker back injuries. With 30% of the United States population meeting the obesity criteria and the consequential health risks, it can easily be concluded that the obese population are more likely to require an ambulance at one time or another (JAMA 2010). Boston EMS now deploys a specially retrofitted ambulance with a hydraulic rear lift and a reinforced stretcher to respond specifically to this category of patient. The hope is that the $20,000 cost invested into this piece of equipment will be offset by the reduction of injuries that are more likely to occur when handling a patient of this size without mechanical assistance (Smith 2011).

The London Ambulance Service (LAS) replied to my request for an interview via e-mail. Ms. Sue Carr of the Patient Experience Department reported a nearly identical workforce of 2,970 members although there is a greater ratio of paramedics to technicians. Andrew Kelly, the Administration Manager of the LAS's Health, Safety and Risk Department reported that the largest category for reported lifting, handling, and carrying (LHC) injuries, or incidents was that of having to manually handle patients. This figure for the financial year of 2009-10 was that manually handling patients accounted for 41% of all LHC incidents. The LAS reported the most significant trend in the reduction of back injuries being directly related to the introduction of the ambulance tail lift gate. In his response on January 28, 2011, Mr. Harry Day of the London Ambulance's Safety and Risk Department, reported that no back injuries have been reported since the introduction of the tail lift gate in June 2009.

Deputy Chief Jay Swithers of the FDNY's Bureau of Health Services suggested trends of a different nature. His observations identified that there was an element of fraudulent claims of all types of injury to obtain time away from work by exploiting the benefit of home recuperation

while remaining on payroll for 18 months, particularly during what are considered opportune periods during the year. One example that Deputy Chief Swithers cites is that soon after this benefit was negotiated, the number of members that were unable to perform their duties due to a service connected injury rose significantly in a relatively short period of time. Considering that there have been 3,808 FDNY EMSC incidents of back injury that directly resulted in lost time since the year 2000, the negative impact on the FDNY's consistent effort to operate efficiently can be easily considered substantial. Deputy Chief Swithers also expressed concerns with the current method to prepare the reports that ultimately are the sole basis for injury data collection. He asserted that the Officers preparing these reports can be influenced by multiple factors. One concern is that there is not adequate time permitted to investigate circumstances and prepare these reports properly. The time spent investigating injuries is invariably time taken from another task that may seem more pressing. Determining preventability through an accurate account of the circumstances of an injury could impact the injured parties claim and therefore sway the preparation of the report. He even suspects that Officers may defer the preparation of these reports to the injured party who will eventually return it to the Officer for endorsement and submission. Deputy Chief Swithers' observations and opinions ultimately communicated the limitations of the data being gathered by the FDNY.

Mr Gregg Burzine discussed the willingness of the FDNY to allot funds for the very best equipment designed to reduce injury. Prior to purchasing large quantities of patient carrying equipment the FDNY conducts pilot evaluations to select the most desirable and user friendly items. The process for selection of these new and better devices to carry patients has been bogged down in the past by inconclusive data collection during these evaluations. This was the case for an innovative chair to transport patients down a flight of stairs with a reduced task

impact on the provider. To date, a chair of this design has yet to be selected, three years after its initial testing.

Discussion

The research results certainly suggest that with the right approach EMS worker back injuries can be significantly reduced. The importance of effectively achieving that goal cannot be understated. The methods that are required to accomplish a reduction of back injuries will require time, effort, funds, and cooperation. Realistically some components will be more easily realized than others.

Recognizing our collective deficiency in accurately identifying and recording the root causes for back injuries must be the first step to improve. Acknowledging that progress in this endeavor will require an investment in time and funds, that will eventually be cost effective, is an essential follow up step. The simple answer to one of the research questions was that the root causes for EMS worker back injuries is most likely due to patient handling (FDNY,2010 and LAS, 2011). Although the data that is available will confirm that, the author has determined that most of the data that has been collected is essentially flawed and cannot be considered completely accurate (J. Swithers, personal communication, February 9, 2011). This is where the change needs to begin. In literature reviewed that concluded that a Musculoskeletal Injury Prevention Program must be instituted to achieve positive results, an essential element was to accurately investigate and record how an injury actually occurred (Dailey 2010). Deputy Chief Swithers opinion was in complete agreement with this conclusion but he contends that the methods that are currently in use by the FDNY EMSC to record how an injury occurred are less than thorough and leave much to be desired. Unless these investigations are performed

effectively and consistently, efforts to improve will be hap hazard and the results will be uncertain. To compel an individual to be completely forthright in reporting how an injury occurred, they would need to be somehow indemnified from culpability for the injury. Being partially culpable for an injury could result in claims being contested or denied and will therefore sway the accurate reporting of how the injury occurred.

Once we have learned to accurately document how the ever prevalent back injury occurs we can proceed to take measures to avoid them. Physical fitness of the EMS worker will certainly remain a cornerstone of maintaining health and avoiding any injury. Meeting height and weight requirements and ramping up fitness during an eight week TOP class are not definitive solutions to the problem. How members care for themselves in the months and years following their initial training will ultimately determine their capacity to perform the basic tasks that are essential for EMS work. Inspiring FDNY members to maintain healthy, fit bodies over time is the monumental task at hand. They must be consistently reminded of the importance of fitness and be given the opportunity to live a healthy active lifestyle even while on duty.

As the obesity epidemic continues to grow nationwide (JAMA 2010), the EMS worker is affected by the increased likelihood of encountering an overweight patient that will require lifting and handling. The FDNY routinely finds itself adapting and creating means and methods to move these patients and eventually transport them to definitive care. The safety of both the patient and the emergency worker are compromised when these innovative plans are devised at the spur of the moment instead of investing in the specialized equipment that will safely move these patients. Also, despite the information provided in their basic training, it is apparent that there is an element of the EMS workforce that has succumbed to relative obesity as well.

Reviewing the data gathered from the questionnaire of the FDNY EMSC EMTs and paramedics, the physical fitness of one of the workers was thought to be a contributing factor in the majority of those who incurred a back injury.

An essential investment in reducing back injuries is the timely selection of the most effective patient handling equipment. It is an obvious assertion that reducing the task load for the EMS worker will result in fewer injuries. Two of the most frequent physical tasks performed by EMS workers can be facilitated by enhanced equipment. These tasks are transporting a non-ambulatory patient down a flight of stairs and lifting that same patient into the ambulance. The stair-chair that has been adapted to track over stairs instead of being lifted and carried over them is readily available from multiple manufacturers. Extensive research conducted has concluded that this device will reduce the task load when transporting a non-ambulatory patient down a flight of stairs (Fredericks, Choi, Butt, and Kumar). Relatively minor concerns of the weight of the equipment and where it will be stored on an already crowded ambulance have bogged down its purchase by the FDNY. Another element that was related by Mr. Burzine of the FDNY's Medical Equipment Unit was the poor collection of data during the equipment's initial testing phase. Delays in deploying this equipment can only result in unnecessary and costly injuries to the EMS workforce. Mr. Burzine discussed that the addition of the 1 ½ person stretcher as opposed to the original 2 person stretcher did not require any extensive testing phase and was readily adopted as new ambulances were purchased in 2004. Conversely, the stretcher that is equipped with a battery operated, motorized lift is not currently being considered by the FDNY due to durability and battery charging concerns (G. Burzine, personal communication, December 21, 2010).

Continuing education for the EMS worker routinely is focused on the latest medical advancements that essentially affect the protocols and methods of how patients are evaluated and treated. This tendency fails to acknowledge the importance of the fundamental aspects of the job such as safety and injury reduction. The techniques for moving and handling patients are generally taken for granted once the initial training has been received. The amount of priority placed on safety transcends other occupations. Research revealed that although safety was a concern for the bricklayer, timesaving and productivity were considered first (NSC 2010).

The data gathered by the Bureau of Labor Statistics in 2006 reflected that emergency workers are nearly eight times more likely to miss work due to an injury or illness than the national average. The environment that the FDNY EMSC worker encounters on a daily basis lends itself to an even greater likelihood of incurring a back injury than those who work in less active systems. Research has concluded that an urban environment and any previous back injury will lead to a greater possibility for injury for EMTs and paramedics. The NAEMT survey cited in the literature review reflected that 47% of EMS workers will sustain a back injury during their career while the short questionnaire that was completed by the FDNY EMSC members reflected that 74% suffered some type of back injury during their employment. This research is clearly supported with the frequency of back ailments being reported by members of the FDNY EMSC over the past 11 years. The average of 491 back strains or sprains being reported annually over that period and a peak of 746 incidents being reported just this past year indicates an ongoing and serious problem with no end in sight. Simply counting incidents is not the answer.

Recommendations

The most effective method to reduce the prevalence of back injuries in the FDNY EMSC will be to begin with new members as they initiate their careers. Merely insisting that candidates meet specific height and weight parameters is insufficient. Insist that candidates prepare sufficiently for the daily rigors of EMS work by instituting a physical test similar to that given to firefighter candidates for the FDNY. The physical training for new recruits during their TOP class has improved incrementally over time. A comprehensive review of the physical training for new recruits at the FDNY EMS Academy needs to occur. Ensure that each and every day that they are in training, they lift and carry the equivalent of the patients they will encounter in the field properly, to instill the very best habits to avoid injury. To inspire and encourage continued physical fitness the FDNY should invest in gym equipment for every existing ambulance station and include a dedicated exercise area in all new ambulance station construction. During upcoming contract negotiations the FDNY should bargain for minimum fitness stipulations for anyone assigned to ambulance duty. Even if this would result in an initial cost to the FDNY the investment would most certainly be cost effective.

Researching the efficacy of enhanced ergonomic equipment for handling and carrying patients needs to be conducted in a more structured manner and on a grander scale. The timely implementation of task reducing, patient carrying equipment is paramount to reducing back injuries. In addition the FDNY must invest in specialized equipment for the handling and carrying of obese patients. Task forces of both Fire and EMS members should be pre-determined to respond and perform in a coordinated fashion on these assignments. These task

forces will need to be trained and practiced in the use of the specialized equipment and techniques to handle these particular patients.

I also recommend that the position of EMS safety officer be developed. These officers would supplement the officers that are on field patrol every day. Whenever a member incurs any type of an injury the safety officer would respond to conduct a thorough investigation of the circumstances that led to the injury and document their findings on the supervisor's report of injury form. Safety officers would also respond to large scale, multiple casualty incidents to evaluate and ensure that the FDNY EMSC members are operating in the safest manner possible. These officers would receive specialized training in safety and investigations. The revelation that the data being collected was extremely superficial and prone to inaccuracies was an unexpected finding and is specifically why this recommendation is included. By accurately documenting what is occurring when the members of the FDNY EMSC are injured the first step in reducing injuries can be confidently taken.

Researchers and students may find this report helpful in developing a strategic plan to identify the circumstances that result in the frequency of service connected back injuries for the EMS worker. Future research could focus on the effective recording of meaningful data on a larger scale to better identify the most significant trends for these injuries. Follow up research could be more directly focused on improving the conditions that lend themselves to an environment in which a back injury is more likely to occur.

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Appendix-A Back injury questionnaire cover letter

FIRE DEPARTMENT

420B Weaver Road Bayside NY 11359

718-281-8420

EMS DIVISION-4

TO: Distribution All Division-4 Stations

FROM: Michael Fitton Division Commander

DATE: January 05, 2011

SUBJECT: Back Injury Questionnaire

I am currently enrolled in the National Fire Academy and am consequently engaged in a project researching back injuries that occur while performing EMS duties. The ultimate objective of this research is to improve the safety of our members by reducing the likelihood that these injuries will occur. I am requesting that all division-4 Officers and members follow the link provided to take a short survey in their free time, to assist me in my research. The survey should take only 3-5 minutes to complete and is completely anonymous.

http://www.surveymonkey.com/s/KTNWHP6

Your assistance is greatly appreciated!

Appendix-B

EMS Worker Back Injury Questionnaire Results

1. How long have you been a member of the FDNY EMSC?
    a. Less than 1 year-0%
    b. 1-5 years-5%
    c. 6-10 years-12%
    d. 11-20 years-32%
    e. 21 years or more-51%

2. During your time with the FDNY EMSC how many times have you suffered an injury that resulted in back pain?
    a. Never-26%
    b. 1-5 times-57.1%
    c. 6-10 times-9.1%
    d. Greater than 10 times-7.8%

3. During your employment with the FDNY EMSC have injuries that resulted in back pain, resulted in time lost?
    a. Never-37.7%
    b. 1-5 times- 53.2%
    c. 6-10 times-7.8%
    d. Greater than 10 times-1.3%

4. If you answered an affirmative choice for question 3, how long were you home recuperating or assigned to limited duty?
    a. 1 week or less-41.7%
    b. 1 week to 1 month-33.3%
    c. 1 month to 6 months-20.8%
    d. 6 months to 12 months-2.1%
    e. Greater than 12 months-2.1%

5. If you have suffered a line of duty injury that resulted in back pain, which of the following choices best depicts the circumstances in which you were injured? More than one answer will be accepted.
    a. Lifting or moving equipment-43.9% (25)
    b. Transferring a patient to a carrying device-40.4% (23)
    c. Carrying a patient up or down stairs-54.4% (31)
    d. Lifting a patient into the ambulance-57.9% (33)
    e. Motor vehicle accident-22.8% (13)

f. Other-
    i. Fall
    ii. Losing balance on uneven pavement
    iii. Assault

6. Do you feel that any of the following conditions contributed to your suffering a line of duty injury that resulted in back pain? Choose any that apply.
    a. Your physical fitness-19.2% (10)
    b. Your partner's physical fitness-42.3% (22)
    c. Poor lifting technique by either you or your partner-46.2% (24)
    d. Equipment failure-13.5% (7)
    e. Other-42.6% (23)
        i. Too much heavy equipment
        ii. Partner's actions
        iii. Obese patient-poorly suited equipment
        iv. Stress, overwork, lack of resources, spending too much time in the cramped cab of the ambulance
        v. Weather conditions
        vi. Overweight patient and 2 person stretcher
        vii. Patient movement
        viii. Weight of patient
        ix. Patient's weight
        x. Patient's excessive weight, improper equipment straps, potholes and sidewalk cracks, stair damage
        xi. Obese patient
        xii. Obese patient, no engine company for assist, two small EMTs sent for back up
        xiii. Numerous obese patients
        xiv. Patient reached out
        xv. Partner's height
        xvi. Snow banks, car parked too close to back of ambulance
        xvii. Weight of stretcher and partner's fitness
        xviii. Weight of patient
        xix. Patient movement
        xx. Patient anxiety-movement
        xxi. Poorly designed equipment
        xxii. Unexpected patient movement
        xxiii. Patient movement

7. How would you rate the training provided during your initial training at the EMS Academy for lifting and carrying?
    a. Excellent-10.7%
    b. Good-42.7%
    c. Fair-24%
    d. Poor-22.7%

8. What do you feel would be the best method to reduce the frequency of service connected back injuries in the FDNY EMSC?
    a. More physical training for new employees. Motivating veteran employees to maintain good physical condition and reminding them of proper lifting techniques. High tech, heavy equipment is not the answer. Allowing some patients to walk as long as it does not aggravate their condition (the majority of our calls). Thanks for asking.
    b. Providing more scheduled leave.
    c. Higher physical fitness standards.
    d. They keep adding more stff to carry. The amount of equipment we carry should qualify to have another worker on the bus. Stretchers are very high and I am personally unable to use the latch due to my small hands. Not many patients need to be carried and there should be guidelines to determine who needs to carried. We need lighter equipment. Also having a time limit to treat the patient and run to the hospital is really putting a strain on my back. It is impossible to treat a STEMI patient and begin transport in the few minutes they want us to.
    e. Increased physical fitness. The ability to work out at work.
    f. Mandate the proper use of equipment. Crews need to call for assistance for obese patients. Having members be in better shape.
    g. More modern equipment like the track chair and the auto lift stretchers.
    h. Better equipment and more qualified personnel.
    i. Education. Include a written notice, verbal reminder, and regularly drill proper lifting and carrying techniques.
    j. Allow members to be based at the station instead of in the ambulance to permit more freedom of movement, avoid back cramping, and sedentary life style in EMS.
    k. Better training, physical agility and better equipment.
    l. Better training in lifting techniques.
    m. More practice on lifts and carries
    n. Better training.
    o. Ergonomic carrying devices and work spaces.
    p. Spending more time on lifting strength in the academy.
    q. Better stair chairs and physical fitness training.
    r. More stringent fitness requirements at the annual physical.
    s. Have training that demonstrates that personnel are able to perform their duties by being able to lift a 250 lbs. patient with a partner.
    t. Physical fitness.
    u. Education on proper lifting and purchasing ergonomic devices (stair chair and stretcher)

v. Stricter physical requirements for new hires. Gyms at the stations to assist and encourage members to stay fit.
w. Proper training for lifting at the academy. Acquire smaller and lighter equipment (cardiac monitors/drug bags need to be downsized).
x. The one person stretcher would help. Physical fitness is the key. A gym in every station would help.
y. Better lifting and moving techniques. Higher physical fitness standard.
z. Train more often on different lifting techniques.
aa. Lightweight mechanical stair chairs. 1 man stretchers instead of the 1 ½ man stretchers we have now.
bb. Better straps for the equipment. A backpack for the cardiac monitor. Better stair chairs. Mandatory back up assistance on patients over a certain weight. Adopt the same policy that sanitation members have on lifting weight restrictions. Free gym memberships. Better seats in the ambulance. Allow members to remain at the base for longer periods as ambulance seats wreak havoc on backs.
cc. Better training and lightweight equipment to better handle obese patients.
dd. Amount of equipment to crew ratio change.
ee. Physical training. Raise the physical standard for EMTs and paramedics.
ff. Recurring training sessions on lifting and carrying techniques. Education for back, arm and leg strengthening. Ergonomically designed equipment.
gg. Use of 4 wheeled stair chairs and 1 man stretchers.
hh. Stretchers with foot pumps to raise and lower the stretcher. Ambulances with stretcher lift like the ones used in London.
ii. Redesign the stair chair. Design a flexible carrying device (sheet). Listen to those of us who work the street!
jj. Better stretchers.
kk. Make lifts and carries a tested skill.
ll. More strength training and less running. Stricter pre-employment testing to ensure that candidates can achieve a 125 lbs lift.
mm. The equipment we carry is too heavy (drug bag/monitor) the back of the vehicle is too high. Sitting in the vehicles all day.
nn. Training focused on the specific types of lifts that cause injuries. Refresh lifting training periodically with reminders in bulletins and required journals.
oo. Education on equipment and lifting techniques.
pp. Teach members to lift with their legs not their backs. Replace the current stair chair asap.
qq. Continued training and weight lifting equipment at stations.
rr. More emphasis on training.
ss. Great improvements have been made over the past several years with equipment to help reduce injuries.
tt. The department has to realize that our patient population is getting larger and obese patients are encountered more frequently. Equipment research needs to be directly evaluated by ops. We respond to calls for patients weighing 400 lbs and more on a regular basis without equipment designed to transport them safely.

uu. Ensure that crews call for backup when a patient is too heavy. All injured members should go to communications (watch how quickly most recover).
vv. Promote physical fitness through exercise and nutrition. Officers must ensure that proper lifting techniques and equipment are being used. For example, patients should be transferred to the stretcher rather than lifting the stair chair into the back of the ambulance. Members must recognize their limitations and request for needed assistance. Education regarding prevention versus the log term effects of back injuries.
ww. 3 person crews.
xx. Provide better lifting devices, ongoing lifting and carrying training. Ensure that members recognize when to call for assistance for a lift. Send another ambulance crew to assist instead of an engine company.
yy. Getting appropriate assistance when lifting heavy patients.
zz. Members should stay physically fit and know their limitations.
aaa. Better physical training of the members. More reliable equipment.
bbb. Constant and updated training.
ccc. Have potential employees begin a PT regimen before being hired, then increase the PT during Academy trining.
ddd. Better physical fitness.
eee. Motorized lifts, lighter equipment, and reinforcement training at the academy.
fff. Adopt the new stair chair that was tested.
ggg. Better equipment.
hhh. Increased physical fitness of the members and ongoing training on lifting and patient handling.
iii. Lift gate or a ramp on the vehicle.
jjj. A regimen of physical fitness incorporated into the work schedule, i.e. training 30 minutes twice a week.
kkk. Better equipment
lll. More physical training.
mmm. Stricter physical standards and a comprehenc=sive health and wellness program.
nnn. The use of updated equipment such as 4 wheeled stair chairs, stair chairs with tracks for stairs, lighter one man stretchers, and battery assisted lift stretchers. Since the specialized stair chairs are heavy allow units to have 2 types of chairs for different circumstances. Reduce the amount of equipment that needs to be brought to the patient's side. Reducing the load can reduce the occurrence of injuries.
ooo. Tell crews that not everyone needs to be carried. Those that are stable and can walk should walk. Those that can step up into the ambulance should do so.
ppp. Physical training equipment should be available at all EMS stations.
qqq. Research and develop a better stair chair. Emphasize better fitness and proper lifting techniques. Make it easier to request assistance from another crew for lifting.
rrr. Different stair chair.
sss. Better lifting training.
ttt. Regular physical training and activity.

uuu. Carry patients routinely to maintain muscle tone. Remove the shoulder straps from the portable equipment.

vvv. New stair chairs with tracks for stairs.

www. Better equipment.

xxx. Modern up to date equipment.

yyy. Power assisted stretchers.

zzz. Hydraulic lifts for the back of the ambulances.

Appendix C

Interview of Lieutenant David Russell of BOT

Interview conducted at the FDNY EMS Academy, Fort Totten, NY.

Date: 12/17/10 Time:1530 hours

Question: What is your title and function regarding the new recruits of the FDNY EMSC?

Answer: I am the Health and Fitness Training Officer. I am responsible for training all new recruits in lifting and carrying techniques and giving them the knowledge to withstand a 25 year career in regards to physical fitness and training.

Question: How long have you been working in this capacity?

Answer: 21 years

Question: What is your educational background in physical fitness?

Answer: I have two personal training degrees. One is from University of Maryland as a Personal Fitness Trainer and one from Hofstra.

Question: How has the physical training component of the Training Orientation Program (TOP) evolved over the past 10 years?

Answer: We have become more oriented to teach the students to lift properly and not injure themselves, particularly their backs. We have increased the emphasis on calisthenics and aerobic and anaerobic training, as well as general nutrition. This nutritional information allows the recruits to make better eating and drinking selections.

Question: Have you observed any obvious trends in the FDNY's hiring practices over the last 10 years?

Answer: The screening of new recruits has improved in that the FDNY EMSC no longer hires candidates that are fat and overweight. If they don't meet height and weight requirements, candidates are directed that they need to reduce their weight before being considered for employment. Another observation that I have made is that a majority of our male and female recruits are relatively young. Primarily our recruits are 25 years of age and

younger. Most recently I have noticed an element of older candidates over 40 years of age. Personally, I attribute this to the economy and the scarcity of jobs.

Question: What, in your opinion, is the overall physical fitness of the new recruits upon entry to the FDNY EMS Academy?

Answer: I think it is poor. Most of the young men and women coming onto this job are out of shape. Many experience difficulty running a quarter mile during physical training. I don't think that physical fitness is a priority in the lives of our recruits prior to their employment here. My counterparts at the Fire Academy and the Police Academy tend to agree with these opinions.

Question: Do these recruits have a significantly improved level of physical fitness upon completion of the TOP?

Answer: Undoubtedly. I have had recruits who have lost 10-20 pounds during the 8 week program. In the beginning of the course the recruits are timed in a 1.5 mile run. They are timed again towards the conclusion of the program. Invariably all improve their times.

Question: Is there an effort to encourage new recruits to maintain their physical fitness after completion of the TOP?

Answer: Yes. We encourage the recruits to return to use the exercise equipment available at the FDNY EMS Academy whenever the facility is open.

Question: What specific training is offered during the TOP classes to help to avoid back injuries?

Answer: Our training method is to split the class in half. One half will practice "lift and carry". This is a supervised exercise in which the candidates practice carrying each other utilizing each of the pieces of carrying equipment that are used to carry patients in the field. These include the "stair chair", the "scoop stretcher", and the "back board". The recruits also practice loading each other into the ambulance using the wheeled ambulance cot or stretcher. The other half of the class will be engaging in select exercises such as calisthenics and core strengthening exercises. Although there are some exercises that focus on upper and lower body strength, we primarily focus on strengthening the torso, or the core. This improves the strength of the abdomen and the back to specifically try to avoid back injuries.

Appendix-D

Interview for Mr. Gregg Burzine

Interview conducted at the FDNY Medical Equipment Unit office in Queens, NY.

Date: 12/21/10 Time: 1500 hours

Question: What is your title in the FDNY?

Answer: Director of the Medical Equipment Unit (MEU)

Question: Please provide a brief explanation of the role of the Medical Equipment Unit as it relates to the FDNY EMSC.

Answer: MEU oversees the procurement and the determination of the specifications of the medical equipment used by members of the FDNY. Our unit also conducts preventive maintenance, repairs, and decontamination of this equipment. MEU supports FDNY Operations in all aspects that are related to medical equipment. As Director of the MEU I am also a member of committees that conduct research to select the best new equipment for our members to use in the field.

Question: What changes have been made to the equipment used for the moving and lifting of patients over the past 10 years?

Answer: Essentially the only real change to the EMSC's equipment that involves patient movement is the introduction of the 1 ½ rescuer stretcher which replaced the former 2 rescuer stretcher.

Question: When was this equipment change implemented?

Answer: In 2004. The new stretcher was phased in over a period of 2 years as new ambulances were purchased

Question: How did research and testing play a role in the selection process for this equipment?

Answer: The decision to introduce the 1 ½ rescuer stretcher was a simple one that did not require a great deal of research. The method to lift the stretcher to an upright position with a patient on

it was significantly less physically difficult that lifting the 2 rescuer stretcher into the back of an ambulance.

Question: Were injury rates and their costs a driving factor to seek out better more ergonomic equipment?

Answer: I am certain that injuries are a major concern that the manufacturers consider when they create and introduce new equipment. My decision to recommend purchase of any equipment is to select the best quality equipment that is best suited to the end user. You have to consider the volume of EMS work that is conducted in NYC when selecting equipment. We need durable equipment that gets the job done efficiently.

Question: What equipment is currently being piloted in the EMSC?

Answer: The EMSC is currently performing a second test pilot for upgraded “stair chairs”. These are chairs designed to facilitate carrying patients down stairs. These chairs have tractor type belts on the back of the chairs. Essentially the patient slowly rolls down the stairs as the chair is held by a rescuer from the top and guided by a rescuer from the bottom. This avoids the need for the patient to be lifted and carried as the rescuers attempt to navigate a flight of stairs. The data from the first pilot was inconclusive and did not result in our purchasing a new device. This time the data collection is being done more methodically. One concern is the weight of the device. It weighs approximately 20 additional pounds more than the simple carrying chair that is used today. This is a potential hindrance to our members as they attempt to access patients. There is a consideration for carrying both types of chairs on the ambulance. That creates another concern for a place to store this equipment on the ambulance. We seem to be routinely adding new equipment for our members to use and the ambulance only has so much room to store that equipment.

Question: Have there been any recommendations for injury avoidance equipment that have been deemed to not be cost effective?

Answer: No. In all of the evaluations cost is not a major consideration when deciding which equipment is best for the field members to get the job done. A good portion of the equipment that is purchased is included in the capitol funding and incorporated into the cost of acquiring new ambulances. The cost of one piece of equipment from one vendor versus a less expensive version from another vendor has never been a factor when selecting equipment. The most effective, best quality equipment is invariably what gets purchased.

Appendix-E

Interview of Deputy Chief Jay Swithers

Interview conducted at the Bureau of Health Service's office at FDNY HQ, Brooklyn NY.

Date: 02/09/11 Time: 1230 hours

Question: What is your title/function in the Bureau of Health Services (BHS)? How long have you performed in this role?

Answer: I have been working at the BHS since 1999 as the Director of the unit that coordinates worker's compensation claims. My position expanded from the Director of Worker's Compensation to include the coordination of the EMS worker's light duty details. I also provide counsel to those EMS members that can no longer work due to a service connected injury and may be applying for a disability pension.

Question: What prior experience prepared you for this role?

Answer: Initially my educational background was decidedly lacking due to my entering the EMS workforce in 1984 prior to my completing my college degree. At the time that the municipal EMS workforce obtained the benefit to be compensated for the first 18 months of a "line of duty injury" (LODI) there were approximately 30 members, or 1% that were incapable of working due to a service connected injury. Soon after that benefit was obtained the number jumped significantly, rising to nearly 300, or 10%, in a relatively short period of time. These injured members were mandated to remain at their place of recuperation during business hours. In 1991 this mandate resulted in a unit being formed to monitor compliance to this policy. I was one of the original members of this unit. This initiated my experience in the arena of worker's compensation. One of the additional objectives of the unit was to streamline the processing of claims. Primarily due to this experience, I was recommended for this position in 1999 when the previous Director resigned.

Question: What other qualifications or affiliations do you have that are pertinent to your role in the Bureau of Health Services for the FDNY?

Answer: The FDNY has an Incident Management Team (IMT) that mirrors Incident Management Teams at the federal level. At the federal level each position in the ICS (Incident Command System) structure requires certification. In the ICS I am certified as a Compensation Claims Unit Leader for the IMT which falls under the Finance category. In that role I facilitate claims through the federal workers compensation process. I am proud to inform you that this

certification is not common and consequently the FDNY gets a number of requests for my services at large scale incidents.

Question: What trends have you observed regarding back injuries during your tenure in your position (overall fitness of the injured member/use of certain equipment when injured/injured members engaging in specific activity/time of year, such as holidays, etc.)?

Answer: When I was a member of the compliance unit that I mentioned previously we experienced that significant jump in claims of injury soon after the benefit of home recuperation was obtained. There was a commonly held suspicion that some of these injuries were exaggerated or fraudulent. Personally, I prefer to not suspect that any injury claim is fraudulent but our research showed that overall service connected injury claims increased just prior to major holidays such as Thanksgiving and Christmas with a number of members returning to duty directly following those holidays. Specifically regarding back injuries, I have found that the Officers who prepare the claims documents routinely classify the injury as being unavoidable. I question whether there is sufficient investigation into these injuries to actually determine whether they are unavoidable. My opinion is that most times Officers are primarily just completing the paperwork so that their members are not denied benefits. Since I still routinely perform ambulance duties outside of the FDNY, I frequently observe poor lifting techniques and a reluctance to call for additional assistance when needed. I have also noticed that when new pieces of patient handling equipment are introduced there is an increase in claims directly related to that equipment. The change to the 1 ½ rescuer stretcher from the 2 rescuer stretcher may have helped to reduce back injuries but I began to see an increase in hand injuries from being pinched by the levers that the members were unfamiliar with.

Question: In 1994 the FDNY began introduction of the 1 ½ rescuer stretcher in an effort to reduce back injuries. The data collected does not reflect any reduction following its introduction. What is your opinion on that data?

Answer: The data that is being recorded by the FDNY is fairly generic in that it does not specify specifically how an injury was incurred. We do not know from reviewing that data if the injury occurred while carrying a patient on a stretcher, or lifting a stretcher into an ambulance, or carrying a patient down a flight of stairs in a chair. Consequently it is difficult to track the effectiveness of that specific piece of equipment. Also our means to collect this data comes from the forms that are completed by the Officers who rarely observe the occurrence of an injury. This makes it very difficult to determine if everything was done to avoid getting injured. When I speak to newly promoted Officers during their training I encourage them to investigate claims assertively by interviewing witnesses and even the patients themselves, if it is feasible. The objective is to determine whether the details of the circumstances leading to the injury coincide with the claim made by the injured member.

Question: What methods, if any, do you currently employ to investigate the legitimacy of a back injury claim to determine a member's eligibility for disability benefits?

Answer: The only method we currently have at our disposal is the form that is being completed by the Officer regarding the injury claim. Many times I actually suspect that the injured member has completed their own claim form and had it endorsed by the Officer. That practice is completely unacceptable. When the injured member eventually reports to our offices for further evaluation it is nearly impossible to disprove a claim of back pain. Invasive diagnostic tests are not indicated during the early period following an injury and many sprain or strain injuries result in a short recuperation before returning to full duty. These back injuries that result in a few days away from work reflect the majority of the claims being made. One of the few instances that we may refuse a claim would be when there is testimonial evidence that a member has made a statement that they want or need specific leave time away from work and if they are unable to secure that leave legitimately, they then become injured. My advice to members is to never make those types of statements as it could potentially result in a legitimate claim being denied.

Question: In your opinion, what impact, if any, do false or exaggerated claims of back injuries have on the efficient operation of the EMSC?

Answer: I can't say for sure specifically speaking to back injuries, but I will say that in my opinion overall injury patterns reflect times that members want or need time off from work. I will say that back injuries classified as strains or sprains may be somewhat more susceptible to fraudulent claims because they can be difficult to disprove. Because of the significant EMS 911 call volume in New York City this can have a great impact on the FDNY's operation. Members not reporting for duty due to a claim of injury will result in additional overtime hours being worked by those members that are on duty. This taxes those members who work excessive hours to the point that they may be more likely to sustain a real injury. There is also the very real possibility that some ambulance units may not run for a tour depending on staffing constraints. This represents a huge impact on the efficient operation of the FDNY EMSC.

Question: What recommendation(s) do you think would be most effective to reduce future back injuries to members of the EMSC?

Answer: I think we need to better identify where and how these back injuries occur. Although the Department has acknowledged the importance of the effort to reduce back injuries in the EMSC, because accurate and useful data is so difficult to collect on a grand scale, there is less than adequate follow through on this initiative. Much of the data that is being collected by the FDNY is being collected to satisfy federal and state mandates. The resources are not currently dedicated to collect more meaningful, detailed data that would be analyzed in an effort to reduce back injuries. I would recommend that there be Officers designated to investigate injuries soon after they occur. These Officers could respond to incidents that resulted in members being

injured and interview claimants and witnesses to determine what could have been done to avoid the injury. They could ensure that the injury claim documents are filled out appropriately. In my opinion, too often documents are prepared with the sole purpose of ensuring a claim is approved instead of determining preventability. In order to obtain accurate information regarding a claim of injury, we need to remove the threat of a benefits being denied because an injury was preventable. If we are serious about reducing injuries we need to have accurate information on how they occur and I doubt that we consistently have that information now. Officers also need to realize the impact that the claim document that they are responsible to complete can have on the Department. Any given injury can potentially result in someone not reporting for duty for up to 18 months and perhaps a disability pension after that. Considering all the incidental costs that are incurred in that scenario, it is imperative that we improve our methods to document and attempt to reduce all injuries.

Appendix-F

London Ambulance Service Feedback/Interview

From: MICHAEL FITTON
Sent: 17 January 2011 21:44
To: PED (Patient Experiences)
Subject: Back Injury Research Project

Good day brethren,

My name is Michael Fitton. I am a paramedic employed by the Fire Department of New York City in the USA. I have been employed by NYC as a paramedic for the past 27 years and currently I hold the rank of Division Chief in the Borough of Queens (no pun intended). I am enrolled in the National Fire Academy which is affiliated with the Department of Homeland Security here in the USA. I am conducting a research project to determine the root causes of back injuries suffered in the line of duty in the Emergency Medical Services.

As it is difficult to identify comparative data from services that handle the volume that FDNY EMSC does, I am reaching out to you in London for assistance. More specifically, if you can provide any answers to the following queries to be included in my research it would be most appreciated:

1) How many paramedics and or Emergency Medical Technicians do you employ?

2) How frequently have your members reported back injuries or strains, annually, over the last 10 years?

3) What trends have you been able to identify as the root causes for back injuries or strains for your members while involved in their duites on the ambulance?

4) What equipment have you adopted to reduce injuries, if any? If you have upgraded your equipment, have you seen any marked reduction in back injuries that can be attributed to this equipment?

My work e mail is fittonm@fdny.nyc.gov

Any assistance would be greatly appreciated. Be safe!

Mike Fitton

>> Harry Day <Harry.Day@lond-amb.nhs.uk> 1/28/2011 8:47 AM >>>
Hi Mike

In response to your enquiry

'What equipment have you adopted to reduce injuries, if any? If you have upgraded your equipment, have you seen any marked reduction in back injuries that can be attributed to this equipment'

Back injuries are still our biggest 'Achilles heel' due to the nature of our work and first and foremost we asked all operational staff to carryout a one minute dynamic risk assessment based on the mnemonic TILE, this being Task, Individual, Load and Environment.

Up until June 2009 our mainstay for equipment with regards to manual handling were as follows:

Pegasus Trolley Bed
Overall length 192cm Height (min) 47cm **60 kg** Load Capacity **200 kg** **(31 stones)**

Falcon 6 Trolley Bed
Overall length 191.5cm Height (min) 45cm **56kg** Load Capacity **181kg** **(28.44 Stones)**

Ferno 35a Easi Loader
Overall length 200 cm Height (min) 23 cm **34kg** Load Capacity **227 kg** **(35.7 stones)**

Compact 2 Stainless Carry Chair **10kg** Load Capacity **200 kg** **(37.5 stones)**

With a slow replacement programme incorporating tail lift ambulance we now have

Stryker Trolley Bed **66kg** Load Capacity **318 kg** **(50 stones)**

Not one reported Back Injury since introduction June 2009

Trials taking place with 3 chairs, 2 being track laying Stryker pro plus and Ibex 5 and an electric stairclimbing chair C-max

Hopefully this will tie in with some of the data and statistics my colleagues will be sending you

With regards

Harry

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>>> Sue Carr <Sue.Carr@lond-amb.nhs.uk> 2/3/2011 8:28 AM >>>
Hello Mike, please see info below. I believe that Harry has already responded on point 4
As for staffing levels, we have 1156 paramedics, 682 student paramedics and 1132 technicians currently employed.
I hope this information is helpful.

Regards

Sue

Sue Carr
Patient Experience Department

Tel 0208 206 9006
Mob 07799347399

From: Andrew Kelly
Sent: 03 February 2011 11:48
To: Sue Carr
Subject: RE: Back Injury research.

Sue,

Here is my data for points 2 and 3

Financial Year	Total LHC Incidents	Hours Worked	Incident Rate (Per 10000 incidents)
2005/2006	730	2082246	3.51
2006/2007	810	2133467	3.80
2007/2008	752	2241733	3.35
2008/2009	553	2599512	2.13
2009/2010	545	2668289	2.04
2010/2011	469	2085169	2.25

In 2009/10, the largest category of LHC Incidents was still simply having to manually handle patients, accounting for approximately 41% of all LHC incidents, although this figure is historically down following introduction of tail lifts on our ambulances. Following closely is having to lift heavy patients, with 26% of all LHC incidents, again down following the introduction of manual handling equipment.

A category which is showing an increasing trend, but only accounting for 4% of all LHC incidents, is manual handling injuries caused by carrying equipment, as the amount of equipment being carried is steadily increasing.

Regards,
Andrew Kelly | Administration Manager | Health, Safety and Risk Department | London Ambulance Service NHS Trust | 8-20 Pocock Street | London | SE1 0BW | T: 02077832566 | Internal: 182566 | F: 02077832569 | E: andrew.kelly@lond-amb.nhs.uk | W. www.londonambulance.nhs.uk

Appendix-G

FDNY EMSC Back Injury Comparison Chart