

**Reducing Workplace Injuries Within the Newark, OH Division of Fire/EMS**

A research project submitted to the Ohio Fire Executive Program Class 11

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### Certification Statement

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## Abstract

The Newark, OH Division of Fire/EMS has experienced firefighter injuries. Some of the episodes required extended absences and significant financial outlays. Two firefighters have retired due to their injuries and several more continue to suffer. Additionally, the division utilizes an injury packet which was developed by an external stakeholder.

This study sought to discover methods that could aid decision makers pursuing a reduction strategy. A descriptive-based methodology sought to identify methods to reduce the frequency and severity of workplace accidents within the department. Furthermore, a survey was developed and delivered which attempted to answer the following four questions:

1. When and where are individuals experiencing injuries?
2. What circumstance(s) or condition(s) may have contributed to the injuries?
3. Do other fire departments actively promote workplace safety?
4. What systems, or best practices, are available to track, measure, and quantify the workplace injuries?

Procedurally, a survey instrument was delivered to other life safety organizations to seek out the collective mindset as it applies to firefighter safety. Additionally, five human resource professionals were polled as well. Furthermore, all internal injury reports from 2005 – 2011 were collected, organized, and reviewed.

The results of the research indicate a conflict between organizational values and behaviors. Human error and risk taking caused a number of injuries. Injury reports were not reviewed and oftentimes incomplete. The agency could minimize human suffering and financial denigration by employing a robust safety-enhancement and records review program.

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## Introduction

The Newark, OH Division of Fire/EMS (NFD) identifies the values of safety and efficiency in its mission statement however; a chasm exists between the standards desired and the behaviors experienced. The agency has had to address the aftermath of a horrific accident involving two fire trucks the morning of Christmas Day, 2004. Two members have received disability retirements and several more continue to experience physical and emotional hardships because of the accident.

Another very serious injury has occurred. While attempting to retrieve a snow shovel, a supervisor fell from an overhead mezzanine. When landing on the concrete apparatus bay, the worker struck his upper torso on the bumper of a reserve fire engine. The injuries received were severe and the pain continues today. A concise report of the actual financial impact accrued is incomplete as the member is unable to work from time to time.

Additional injuries have occurred while firefighters were engaged in suppression activities. A large multi-family structure had caught fire and during the attempt to mitigate the emergency, an aerial apparatus applied water through an overhead ventilation opening. A member assigned to interior operations received respiratory injuries as a result. One could reasonably presume the use of a Self-Contained Breathing Apparatus (SCBA) was not in effect at the time of injury. In all fairness, the benefit of hindsight is just that. There could have been an appropriate reason for the non-deployment.

*The problem this study will address is the frequency and severity of injuries within the Newark, OH Division of Fire/EMS.* The agency continues to incur decreased productivity and increased costs due to injury related absences. Furthermore, the agency lacks measurement tools that track and analyze injuries. Numerous reports of minor injuries are on file well. Lastly, there

is no clear or stated purpose for documenting injuries.

Additional areas need review as well. There is no concise barometer of when and when not to report injuries. This in and of itself results in decreased productivity as managers are oftentimes tasked with completing a lengthy injury packet. After reviewing division injury reports, one could surmise the employer wishes to insulate itself from worker's compensation liabilities. An abbreviated report that documents injuries of a minor nature does not exist.

An internal audit of workplace injuries within the NFD reveals noteworthy discoveries. Although managers express a stated desire for the safe and efficient delivery of services, the findings were contradictory. Members continue to engage in risky behaviors such as not wearing Body Substance Isolation equipment (BSI) while assessing patients, entering a burning structure without the aid of a Self-Contained Breathing Apparatus (SCBA), and tossing supplies to one another rather than simply handing them off directly.

Another finding worthy of attention is the actual process used to document occurrences. An injury packet is in place and seems targeted towards back injuries and worker compensation claims. In many instances, the packets are not entirely complete. Furthermore, the employer does not appear to be concerned with metrics that identify cause and effect. Methods utilized to reduce the frequency and severities of workplace injuries are not clearly established.

The challenge faced is a continued pattern of improperly documented workplace injuries. Members continue to take risks, exposing themselves to harm and the agency to liability. Enhanced safety measures have not reduced the time necessary for supervisors to document occurrences. Additionally, firefighters report instances of inhalation injuries without proper personal protective equipment in place. Furthermore, existing records are incomplete and do not contain purposeful information.

*The purpose of this study is to identify and describe methods to reduce both the frequency and severity of firefighter injuries within the Newark, OH Division of Fire/EMS. The resultant product offers an enhanced model of service. The division will be better able to meet its mission of safe and efficient service delivery. A descriptive-based methodology will uncover pertinent, timely, and relevant information. The researcher will quantify division injury reports, conduct literature-based reviews, as well as deliver a survey to agencies with a similar mission.*

*The research questions this study will investigate are:*

- 1. When and where are individuals experiencing injuries?*
- 2. What circumstance(s) or condition(s) may have contributed to the injuries?*
- 3. Do other fire departments actively promote workplace safety?*
- 4. What systems, or best practices, are available to track, measure, and quantify the workplace injuries?*

## Background and Significance

In 1886, the citizens of Newark, OH founded the Division of Fire/EMS. The department enjoys a rich history of dedicated men and women responding to the life-safety needs of the community. Currently staffed by 83 members providing prevention, education, fire control, and emergency medical services; decreased budgetary allotments and increased stakeholder expectations present complex managerial challenges. Compounding the difficulty is decreased productivity due to workplace injuries.

The NFD operates out of four stations situated geographically throughout the region. Station One is located centrally and assumes over 60% of the workload when measured by call volume. Stations Two, Three, and Four answer the remaining calls for service with the last being somewhat less involved from a statistical point of view. The first three locations house an engine company and transport unit as well as a limited array of specialized equipment. Station Four lacks a transport unit while Station One houses and deploys a command unit staffed by a single battalion chief.

The NFD has faced increasing demands for services while realizing decreased funding. The agency is averaging approximately 11,500 runs per year (see fig. 1). Of the total, 7,500 relate to EMS while fire related calls average well over 4,000 per year. These demands pose a formidable as managers attempt to balance available monies with services expected. The NFD has seen a \$500,000 drop in fiscal appropriations over the last two years (see fig. 2).

Additionally, a Collective Bargaining Agreement (CBA) is in place between the employer and the International Association of Firefighters Local 109 (IAFF L-109) mandating the employer assign 19 bargaining unit members to duty at all times. In light of declining revenue streams this requirement has become particularly troublesome; the employer lacks the

funding to hire new employees and does not have sufficient funding in place to cover the mandated overtime expenses as they occur.

Restrained by the current contractual obligations, the employer cannot afford to lose productivity for any reason. Currently when a member cannot work, covering members will receive compensation at one and one-half times their normal rate of pay in order to cover the absence. A significant financial motivation exists to reduce injuries and any related leaves. A moral imperative exists as well; leaders have an ethical responsibility to return members to their loved ones in better standing than before.

The city currently has a population of approximately 50,000 residents and encompasses 18 square miles. Seated in the heart of the Licking River Valley, the community prides itself as friendly with a small-town feel. A declining revenue base began in the nineteen eighties as several manufacturers closed their businesses. The political landscape focuses on economic development and although cogent plans are in place, total collections continue to decline.

The employer continues to experience injuries resulting in decreased productivity, efficiency, and personal wellness. A historical review brings forth instances of musculoskeletal, eye, and respiratory damage. Although generally accepted professional practices such as personal protective equipment and policies are in place, the employer continues to suffer. From 2006 to 2010, the employer experienced an average of 16.6 injuries per year (see fig. 3).

In a previously mentioned accident, two fire apparatus collided at an intersection while responding to a report of a house fire. The Officer in Charge summoned all units to a centrally located, downtown station to share a Christmas Day meal. An alarm summoned the units during the meal and all responded. Within three minutes, a tragedy occurred. As the event unfolded, members received air transport to trauma centers and several others received ground transfer to

medical facilities to address serious and traumatic injuries. As of this writing, debilitating injuries have forced two members into retirement. The emotional toll and physical suffering are palpable.

Contributory factors continue to plague the division and magnify the problem of unsafe operations. Members were unrestrained occupants in the above example and received injuries, which were in all probability more severe. In the previous episode, an officer fell from an unprotected mezzanine onto an apparatus bumper approximately ten feet below. As a result, the member continues to suffer from chronic pain.

A review of departmental records uncovers an interesting trend; members were likely to report injuries of a minor nature. Oftentimes, there was no formal medical evaluation required. In some instances though, management is likely to send the reporting member to a medical facility for treatment. Many times the attending physician directs the injured member home for the remainder of the shift.

The NFD has experienced a significant number of back injury episodes as well. Between the years 2005 and 2011, the reviewer was able to document 17 reported back injuries with at least 168 hours of work time lost and the total cost to the agency is unclear. Furthermore, in more than one instance the total of number of hours reported off are undetermined. The lack of comprehensive documentation serves as a detriment to decision makers tasked with the enhancement of member wellness.

The employer does not currently analyze associated costs due to worker injuries. Some metrics to consider are the number of hours missed multiplied by hourly rate to determine lost productivity. In addition, number of hours missed requiring a recall multiplied by one and a half times the hourly rate would show the additional labor costs needed to cover the mandated

staffing levels. These simple metrics would enlighten decision makers as to the significant costs associated with injuries.

Workplace safety deserves a place in the forefront of any managerial agenda. A moral imperative requires supervisors to ensure the wellness of their members. Furthermore, citizens demand efficient operations of the agency they fund. Oftentimes, injuries require fiscal outlays and the prevention thereof can reduce the expenditure. By examining cause and effect, managers are better equipped to implement reduction strategies.

*The potential impact this study could have on The Newark, OH Division of Fire/EMS is enhanced record keeping and member wellness, a reduction of costs, and increased productivity.*

A systems operation that identifies and measures workplace injury(s) would lend itself to the reduction of the same. The findings of this study will offer enhanced efficiency to the citizens who entrust decision makers with the public treasury. They will see an improved use of their monies. Furthermore, members will enjoy increased health and personal wellness. In addition, the division will emerge better equipped to make objective and proactive decisions based on empirical data. When combining the two, the community at large enjoys an improved model of service better equipped to meet and exceed its future needs.

## Literature Review

A review of professional publications such as *The International Journal of Occupational Medicine and Environmental Health*, *Fire Engineering*, *Health Communication*, and *The Journal of Professional Safety* occurred. A query of professional organizations took place as well. Studies conducted by The National Institute of Standards and Technology (NIST) and The National Fire Protection Association (NFPA) were reviewed. An analysis of statistics gathered from the United States Fire Administration (USFA) has occurred. In addition, research submissions to the Ohio Fire Executive Program and the National Fire Academy's Executive Fire Officer Program were reviewed. Lastly, a query of all reports of injuries within the NFD from January 2005 to May 2011 occurred.

In their study, (Szubert & Sobala, 2002) address both the circumstances and conditions contributing to firefighter injuries. In their research, they apply stratified randomization of 1,503 Polish firefighters from 29 fire stations between the years 1994 and 1997. Several of their observations are noteworthy; “the majority of injuries (40%) occurred during compulsory physical training, being responsible for 41% of post-injury absence at work. The workers employed for less than one year were at highest risk of injury” (Szubert & Sobala, 2002, p. 49). These findings may be contrary to any conventional belief of fire ground operations presenting the most danger.

The authors further identify non-emergency operations and locations as being responsible for 75% of the total number of injuries (Szubert & Sobala, 2002). An analysis of NFD records mirrors this conclusion. Reports reveal an overwhelming majority of workplace episodes occurred during periods of non-emergent activities. A noteworthy example is a thumb injury while handling a box of tin foil.

Fire ground activities are a leading circumstance of firefighter injuries with an annual average of over 7,000 reports (Karter, 2009). The authors further identify fire extinguishing events are responsible for over 50% of all minor, moderate, and severe injuries. In his offering, (Stonhill, 2005) points to at-risk behaviors as both contributory and measurable. A review of NFD injury reports reveals the same and offers an example; a firefighter received an exposure to toxic gases by entering an immediately dangerous to life or health (IDLH) atmosphere without the benefit of a Self-Contained Breathing Apparatus (SCBA). The discoveries are consistent with the author's premise (Stonhill, 2005).

Others have (Hayden & Mior, 2004) determined that injury prevention program are cost effective. In their study, the authors successfully reduce the costs associated with absenteeism due to back injuries by delivering hands on practice sessions and ergonomic advice. The "Back Informed Program" reduced lost work time and increased worker morale (Hayden & Mior, 2004). This program alone could provide the NFD with significant benefit.

As the cost to address and prevent fighter injuries falls between \$2 to nearly \$8 billion per year (TriData Corporation , 2005), departments have become proactive by promoting wellness and injury-prevention programs. An example of this is The Rancho Cucamonga Professional Firefighters Local 2274 and Fire Support Services. They have agreed to a district fitness program that mandates employees participate at two hours a week (Bryan & Walker, 2010). The program's design seeks to "improve firefighter wellness, expedite injury treatment, and reduce workers' compensation costs" (Bryan & Walker, 2010, p. 10).

A robust educational campaign aimed at fire prevention can lend itself to reducing the number firefighter injuries. The authors employ logic to conclude as the number of fires declines, so will injuries to responders (TriData Corporation , 2005). Additionally, decision makers have

begun to target injury episodes that do not occur on the fire ground (TriData Corporation , 2005).

Another opportunity for enhancement exists here as well. Due to contractual obligations, the NFD currently appropriates more fiscal allotments to suppression as compared to prevention activities (Spurgeon, Approved Budget from Years 2006-10, 2011). If the division could focus its resources towards reduction strategies, potential returns to firefighter safety are significant.

Constituency groups have also encouraged a change in at-risk behaviors. At a professional summit, interested stakeholders developed sixteen life-safety initiatives with the primary objective being a change in cultural norms (National Fallen Firefighters Foundation, 2005 - 2011). A common theme emerged identifying all as responsible for stopping unsafe acts.

During the exercise, participants identified three leading causes of firefighter deaths. Although strategies are in place to address the tragedies, cardiac events continue to claim the lives of members and shatter the lives of their families. Vehicle response and risk management occupy the concerns of service members as serious episodes continue to occur.

While executing the research and review process, a commonality appears. During non-emergent activities, many fire service members are hurt and the injuries are preventable. Furthermore, noticeable and measurable reporting challenges lie within the NFD. Data that is necessary to determine the cause, effect, or cost of injuries is incomplete and sometimes nonexistent. Managing worker's compensation claims is the seeming purpose of collecting information. Improved methods for reducing the frequency and severity of workplace injuries are available and suggested.

## Procedures

The intent is to discover methods to reduce firefighter injuries in the NFD. The process required a descriptive form of research. All existing NFD injury reports from the year 2006 until June 2011 were gathered, organized, and examined. Additionally, a survey was constructed and delivered to twenty fire chiefs and five human resource professionals.

The data collection instrument seeks to discover the organizational mindset of other providers. The questions asked are somewhat pointed and address workplace safety more than once. When reviewed in their entirety, the results present a comprehensive overview of current methods used to analyze injury data. The questions will also reveal if injuries are measured.

The participants selected represent parallel agencies, ones that deliver similar services as the NFD. The targets chosen represent executive level decision makers. They are likely to be responsible for matters of occupational safety. This planning presumption does present a shortcoming; some agencies may delegate the matter to a secondary member or not consider it at all. In addition, some may choose to not complete or return the instrument. As part of the study, the limitations are accepted.

The survey instrument identified industry best practices. The questionnaire petitioned other fire department's chief officers and human resources professionals. The design of the tool hopes to measure organizational commitment to injury measurement and reduction practices.

Research was conducted utilizing academic journals and professional bodies as well. The writer sought the enlightenment of academia primarily due to the fact the data is vetted through research. The goal is to uncover fact as opposed to opinion. Sanctioning bodies such as the National Fire Protection Association (NFPA), National Fallen Firefighter Foundation (NFFF),

and the National Fire Academy were searched as each have extensive databases that address firefighter injuries.

## Results

When viewing the injuries reports of the NFD, a number of somewhat mundane injuries materialized (see fig. 4). No data separates minor and significant injuries. Much of the data observed addressed matters of worker's compensation claims but did not address cause or affect. No long-term data such as return to work dates existed. Additionally, many of the packets were incomplete.

A significant number of the injuries result from moving patients and equipment. Exposures also play a significant role in firefighter injuries. Slips and falls inhibit the well being of members as well. Furthermore, exposures to harmful substances have negatively affected many members.

Several of the exposures and injuries should not have occurred. Reports indicate eye protection as lacking on several exposures. In addition, no guardrails were present during a significant fall. On several occasions, injured members lifted patients alone rather than summoning help. On another, a member broke his elbow and was absent for an extended period due to leaning back in a chair.

Additional trends appeared which deserve recognition. Members tend to over-report injuries although no basis is given. Several reports of minor injuries, strains, and sprains exist although none required a doctor's visit or hospital stay. No clear separation of minor versus major injuries is apparent.

Respondents returned ten of the twenty-five surveys. Some selected more than one answer to a particular question. Of the ten reporting, all had given thought to firefighter injury(s). Additionally, all reportedly remembered when the event took place. Seven of the ten reported the

injury took place during an emergency response, while others indicated seven episodes of injuries during non-emergency activities.

Responses vary when asked about the location of an injury episode. Nine reported the injury occurred at an emergency scene, five identified a station as the location, four stated an off-site training event, and one answered other. None of the respondents was unsure.

The survey then inquired about the time of day the injury had occurred. Four of those surveyed indicated the hours were between six in the morning and noon. Four others chose between noon and six pm. In addition, four more answered between 6 pm and midnight while two others pointed to the hours between midnight and six am. Two other respondents were unsure.

The responses to contributing factors vary as well. A majority of those answering identified risk taking (5) and human error (5) as contributory. Two selected the weather, three chose lack of training, one chose equipment failure or malfunction, and one identified the lack of equipment safeguards as playing a role in the episode.

All ten of those responding to the survey consider workplace a personal priority and all ten feel their employer does as well. When asked about safety discussions among themselves, nine of those answering indicated they discussed safety often and two said they did but, not very much.

The survey then asked if their employers' documents workplace injury(s). All ten answered in the affirmative. The next question inquired if any designation exists between severe and minor injuries. Six answered yes while five said their employer did not make a distinction. The next inquiry addressed if respondents employer evaluates their respective records to determine cause and effect. Seven indicated yes and at least once a year while three

said they did not. Two more replied their agencies do evaluate injury records but do so less than once a year.

A majority of the respondents indicate their employer uses proactive means to promote worker safety, with training being the most utilized method. The survey then asked the respective years in the fire service and of those sending the instrument back; an overwhelming majority had served more than 21 years (9). One indicated between 16 and twenty years of service. Lastly, one had answered they had been in the service less than five years.

*1. When and where are individuals experiencing injuries?*

According to the surveys, individuals experience injury(s) during both emergent and non-emergent activities. Those surveyed indicate a majority of the injuries actually occurred on an emergency scene. However, a significant number report occurrences at both off-site facilities and the station. Injuries occur equally between six am and noon, noon and six pm, and six pm and midnight.

*2. What circumstance(s) or condition(s) may have contributed to the injuries?*

The responses varied but a majority of the participants noted human error and risk taking as causative factors. Weather and training both contributed to episodes as well. In addition, those surveyed felt equipment was to blame due to failure and lack of safeguards.

*3. Do other fire departments actively promote workplace safety?*

Yes, a clear majority report their respective employer actively promotes workplace safety. All of those surveyed report they and their employer view workplace safety as a priority. Furthermore, ninety percent report frequent coworker discussions with the topic being safety.

4. *What systems, or best practices, are available to track, measure, and quantify the workplace injuries?*

The survey did not elicit a clear indication to this question. The respondents unanimously indicated their employer documents injury episodes. Almost all report a system of safety promotion however, the survey did not inquire as to systems or best practices.

## Discussion

The survey results were remarkable. All those reporting were aware of a workplace injury and the majority had been involved with the fire service over 21 years. Furthermore, all were sure if the event was during an emergency or not however, the answers varied as to time of day.

A majority identified human error and risk taking as causative. The reviewer might find this interesting when compared to the overwhelming sentiment of workplace safety; it is a priority for both member and employer. Furthermore, a clear majority frequently discuss workplace safety among themselves. The contradiction between priorities and behaviors deserves attention.

Those responding unanimously indicate the employer documents workplace injuries. Furthermore, a majority indicates agencies draw a distinction between minor and severe events. Additionally, most require a medical evaluation for any injury reported. A majority analyze injury reports to determine cause and as well.

Internally, a lack of organizational attention to injury reports was evident as they were oftentimes incomplete. The agency does not demonstrate a commitment to analysis of existing data. Furthermore, the instrument being used did not appear to receive sufficient focus. The NFD could enhance the safety of its members by developing its own document and measuring the reports periodically.

A disconnect exists between values and behavior. While the majority of participants identify safety as a personal commitment, many are injured while moving patients without assistance. The division could realize an efficiency if it were to develop and deliver training which identifies proper lifting techniques.

Another area of concern is exposures. Members report accidental needle punctures and respiratory injuries. Safe handling techniques and personal protective equipment training could reduce the hazards. Developing alternative handling methods by engaging those involved would lend success to the endeavor.

Other departments have successfully deployed such methods to enhance safety. The Rancho Cucamonga (CA) Fire Protection District used a collaborative fitness program to reduce the number and cost of worker's compensation claims (Bryan & Walker, 2010). Members and managers sought to reduce cardiac events. All members have input to develop the program and in doing so; participants took ownership in its success.

Other agencies use performance data to promote safety. TI Automotive executives utilize a campaign of personal responsibility and empowerment to enhance productivity and safety (Maxfield, 2010). This "culture of accountability" (Maxfield, 2010, pp. 39-40) explains and involves as opposed to threats and punishments. Regardless of the industry, the leaders who are best at holding their people accountable for safety also achieve the best quality, productivity and efficiency.

## Recommendations

The organization could enhance worker safety by analyzing internal injury data. A revision to the injury packet should include a return to work date. Planners could then measure the true cause and cost of an injury. Secondary to this, the division should engage its members. The collaboration would lend ownership and increase success to any reduction strategy employed.

The NFD should mandate a medical evaluation for all reported injuries. This measure would ensure members are fit to reenter the workforce and reduce the number of minor injury reports. For example, a doctor should have seen the injured hand from a roll of foil if it were severe enough to document. Inefficiency exists as the documentation takes a significant amount of time. A majority of those surveyed identified this as standard practice.

The NFD should collaborate with its members to develop a proactive approach to injury reduction strategies. The current data suggest the division accepts injuries as part of its business model. Handrails haven't been added to a mezzanine after a tragic fall, making a future occurrence possible. Common logic would suggest given the time and resources, members would mitigate the hazard.

The NFD should take a more proactive approach to worker safety. Low-expense items such as signs and banners are readily available. A number of those surveyed report the initiative as an industry-best organizational practice. The collaborative model uses the ideas of those directly involved and enhances success rates.

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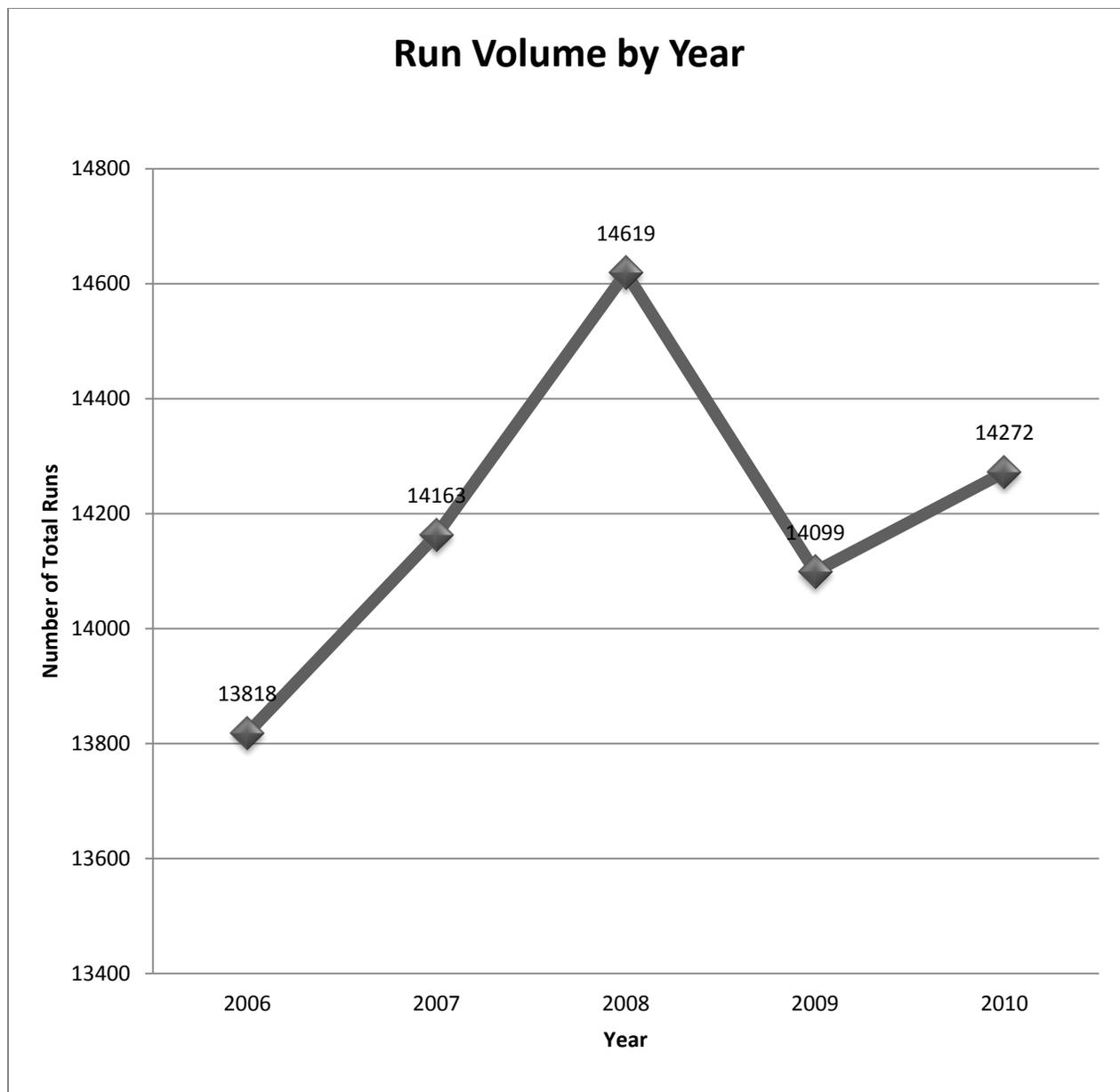


Figure 1- Total calls for service by year.

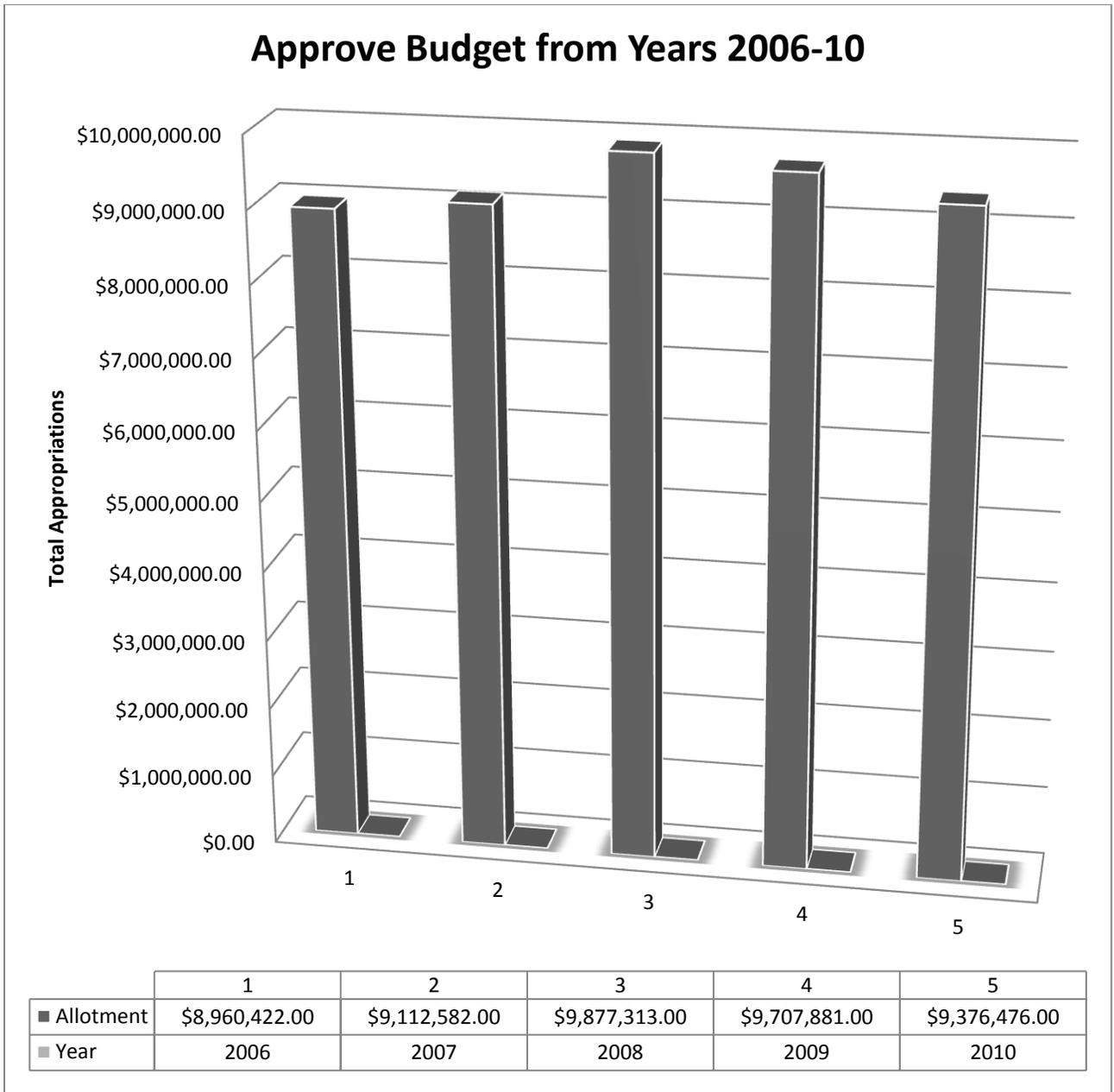


Figure 2 - Total fiscal appropriations by year.

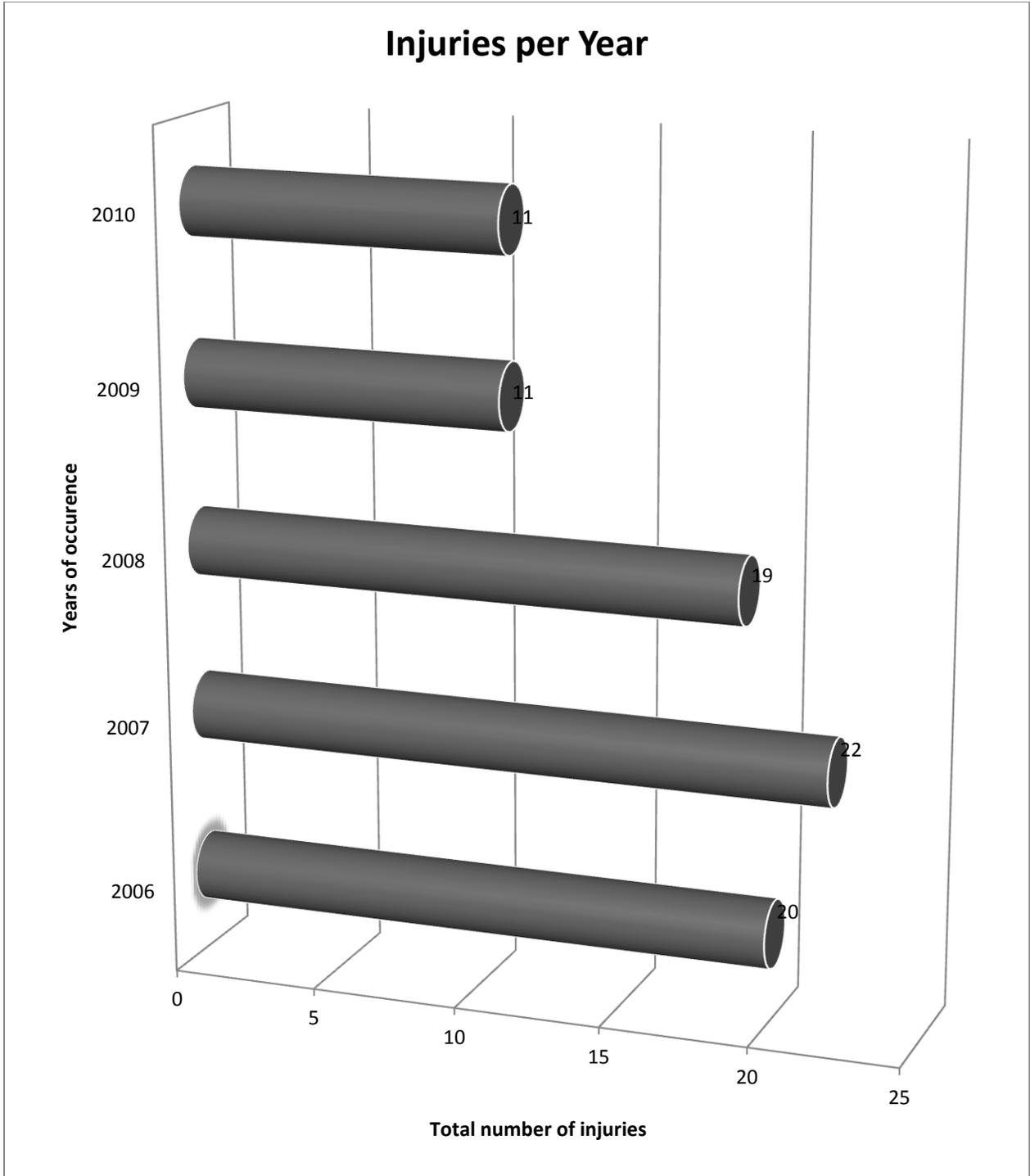


Figure 3 - Total number of injuries by year.

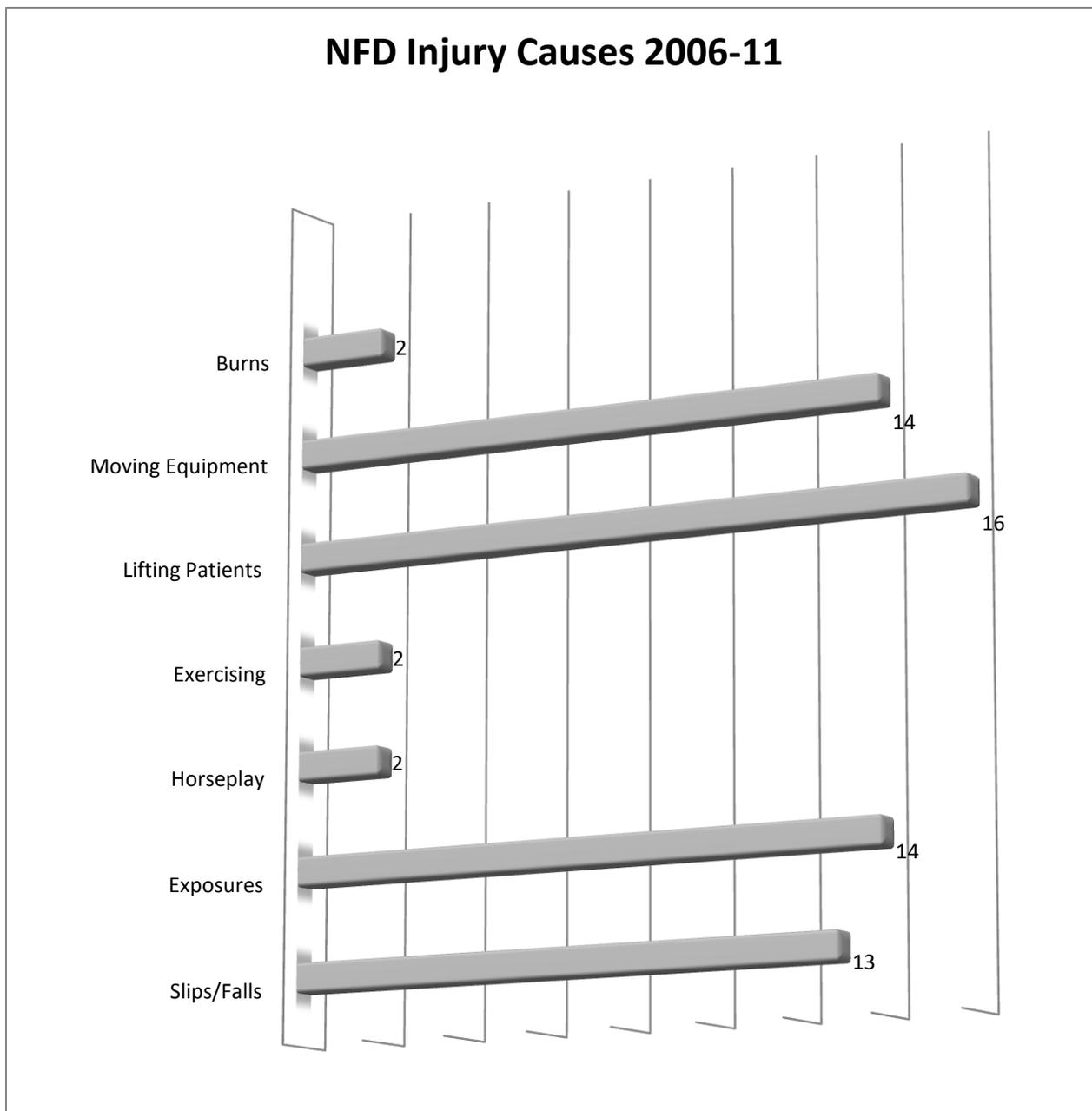


Figure 4 - NFD Injury Causes 2006 – 11.