

Volunteer Firefighter Participation in the  
Anne Arundel County Fire Department Wellness Fitness Initiative

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CERTIFICATION STATEMENT

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

Signed: \_\_\_\_\_

### Abstract

The problem was that volunteer firefighters in the Anne Arundel County Fire Department (AACOFD) were not participating in an annual National Fire Protection Association (NFPA) 1582 physical provided through the Department's *Wellness Fitness Initiative* (WFI), adversely affecting the Department's goal of reducing preventable firefighter fatalities. The purpose of the research was to identify why volunteer firefighters were not participating in an annual NFPA 1582 physical provided in the department-funded WFI. The descriptive method of research was used to answer the following questions: (1) what are the causes of line-of-duty deaths (LODD) among volunteer firefighters in the AACOFD compared with national trends in LODD's? (2) What has the AACOFD done to implement the WFI for its volunteer firefighters? (3) What is the knowledge level of AACOFD volunteer firefighters relating to the WFI? (4) What are the obstacles preventing AACOFD volunteer firefighters from obtaining an annual NFPA 1582 physical as a component of the WFI? A literature review was completed and interviews were conducted. A study group was identified and a survey instrument was developed, distributed, and collected. Research revealed that the experience of LODD's in Anne Arundel County matched those of fire departments across the United States, with heart-related deaths among volunteer firefighters being most prevalent. The survey results identified that volunteer firefighters in the AACOFD are primarily unaware that they are eligible to participate and how to access the WFI. Volunteer firefighters indicated that transitioning the WFI from a voluntary program to a compulsory would have no effect on their intent to continue volunteering in the County. Recommendations included an awareness campaign and the development and implementation of a plan to increase participation by volunteer firefighters in the WFI through innovative and sustainable strategies.

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## INTRODUCTION

On April 24, 1993, Firefighter William W. Overman, Jr. suffered a fatal heart attack while sitting on the tailboard of a fire engine at the scene of a structure fire in Anne Arundel County, Maryland. He was 48 years old and was operating on his first call as a volunteer firefighter (Runkles, 2002). Firefighter Overman had served honorably as a Corporal in the United States Marine Corps and was a Vietnam War veteran. He was survived by his wife, Marion M. Overman, and two daughters, Helen and Kathleen Overman ("Obituary," 1993). Although not the first LODD in the history of the Anne Arundel County Fire Department (AACOFD), Firefighter Overman's case serves as the foundation upon which this research is undertaken. Although there is no way to retrospectively determine whether an annual physical could have prevented Firefighter Overman's death, what is known is that the AACOFD did not require one. Frequently, statistics replace the human component of the effect that line-of-duty deaths have on a family and on organizations. Although this research effort is focused on investigating the prevention of such deaths, it is expected that those who have made the ultimate sacrifice will never be forgotten and that they will live on in the hearts and memories of those seeking to prevent similar tragedies.

The research problem is that volunteer firefighters in the AACOFD are not participating in an annual National Fire Protection Association (NFPA) 1582 physical provided through the department-funded Wellness Fitness Initiative (WFI), adversely affecting the department's stated goal of reducing preventable firefighter fatalities and injuries. The purpose of the research is to identify why volunteer firefighters are not participating in an annual NFPA 1582 physical provided through the Department-funded WFI.

The descriptive method of research will be used to answer the following questions: (1) what are the causes of line-of-duty (LODD) deaths among volunteer firefighters in the AACOFD compared with national trends in LODD's? (2) What has the AACOFD done to implement the WFI for its volunteer firefighters? (3) What is the knowledge level of ACCOFD volunteer firefighters relating to the WFI? (4) What are the obstacles preventing AACOFD volunteer firefighters from obtaining an annual NFPA 1582 physical as a component of the WFI?

### **BACKGROUND AND SIGNIFICANCE**

The 2010 U.S. Census identifies that Anne Arundel County has resident population of 537, 656 in a land area of 415.94 miles (U.S. Census Bureau, 2011). Located along the western boundary of the Chesapeake Bay, the County is bordered to the North by Baltimore City and County; to the West by Howard and Prince George's Counties; and to the South by Calvert County. The County has over 534 miles of coastline and is home to such major installations as the United States Naval Academy, The Baltimore Washington Thurgood Marshall International Airport, and Fort George G. Meade, upon whose campus the National Security Agency is located (Anne Arundel County, Maryland website, 2011). The County is located between the major urban centers of Baltimore, Maryland, and the District of Columbia. The city of Annapolis is located within the geographic borders of Anne Arundel County but is a separate entity of government.

The AACOFD was created in 1966 after Anne Arundel County altered its form of government from a commission style to a charter form (Tri-Data Corporation [Tri-Data], 2008, p. 11). In doing so, Anne Arundel County appointed Harry W. Klasmeier as the inaugural Fire Chief and during his tenure from 1996 through 1983, Chief Klasmeier is credited with merging the independent volunteer fire companies located within the County into a single fire department

(Tri-Data, 2008, p. 11). In addition, he established a central communications dispatching center, oversaw the construction of a training academy, and created a proactive and assertive fire prevention bureau (Tri-Data, 2008, p. 11).

Today, the department regards itself as the “Nation’s Premier Combination Fire Service” (Anne Arundel County Fire Department website, 2011). The department has 818 career firefighter and 37 civilian positions with an authorized operating budget of \$92,078,000.00 for FY12 (Anne Arundel County Office of the Budget website, 2011, p. 277). In addition, the AACOFD has 544 volunteer firefighters who belong to one of 23 volunteer fire companies located in the County. Because the AACOFD was formed when independent volunteer fire companies were organized under an umbrella organization, many retain their volunteer charter and continue to operate as independent corporate entities. Operationally, however, all fire stations within the County are staffed in some configuration by career personnel who work alongside volunteer responders in an integrated organization. Career and volunteer personnel who are accepted into the system are required to successfully complete an NFPA 1582 pre-employment physical which is funded by the County.

The department operates 31 fire stations divided into three geographic battalions. The mission of the AACOFD is “to provide essential emergency and non-emergency services and integrated all-hazard emergency management to the citizens of Anne Arundel County. We are committed to eliminating threats to life, safety, and property through education, prevention and safe effective response and recovery activity to fire, medical, environmental, natural or technological emergencies” (2011). All uniformed personnel (career and volunteer) are trained in accordance with applicable NFPA standards and are certified through the Maryland Fire Service Professional Qualifications Board at the Firefighter II level. Officers are additionally

certified commensurate with their level of responsibility within the department. In 2010, the department responded to approximately 72,000 calls for service including the transport of 41,000 patients to hospitals and 438 residential and commercial building fires.

In order to characterize the significance of the problem in assessing its value in being researched, the research paper will next provide data relating to the scope of the problem and identify the past, present, and probable future impact on organizational effectiveness.

In his compilation of firefighter fatalities, Runkles (2002) identified 18 firefighters who have died in the line of duty within Anne Arundel County. Of those, nine are attributed to traumatic causes including building collapse, burns from flashover, smoke inhalation, and motor vehicle collisions. The remaining nine cases are assigned to medical causes, including eight attributed to sudden cardiac failure and one case resulting from a ruptured aorta. The average age of deaths resulting from trauma is 30.2 years and the average age resulting from medical causes is 50.8 years. Volunteer firefighter deaths outnumber career firefighter deaths 2 to 1 (12:6). The five most recent deaths: Edwin E. Raynor (5/1/1986), Howard N. Phelps, Sr. (01/11/1987), James P. Weeks (10/29/1988), William W. Overman, Jr. (4/24/1993), and William R. Chambers, Jr. (11/12/1996) are all attributed to sudden cardiac failure while on duty (Runkles, 2002). Among the cohort of nine firefighters who died due to medical reasons, five were volunteers and four were career.

In 2006, Division Chief Allen Williams serving as the Chief of Health and Safety for the AACOFD, submitted a grant application through the Assistance to Firefighters Grant (AFG) program administered through the Department of Homeland Security to initiate a WFI. The grant of nearly one million dollars was received by the AACOFD on November 3, 2006, and initiated on August 20, 2007 (Williams, 2008, p. 5). The primary goal identified in the program

is to reduce the risks of sudden cardiac death (listed as the leading cause of death for firefighters). The primary mechanism identified in the program for reducing cardiac-related deaths is an annual medical evaluation in compliance with NFPA 1582 (National Fire Protection Association [NFPA], 2003). The acquisition of the grant has been the key mechanism allowing the department to implement a WFI. “Without the grant, it would have never happened or certainly not to the extent that it did,” (A. Williams, personal communication, June 16, 2011).

The problem is that the WFI has never been applied equally to career and volunteer firefighters. This runs counter to the AACOFD’s vision statement of “our mission will be accomplished by a physically fit and healthy workforce, empowered with a high level of involvement in our success,” (Williams, 2008, p. 4). In creating the WFI, the Department elected to require all career uniformed personnel to participate. Section I of the WFI specifies that all career personnel will be required to participate in the WFI which includes the annual administration of an NFPA 1582 physical and fitness assessment effective August 20, 2008 (Williams, 2008, p. 4).

Conversely, the WFI does not require volunteer uniformed personnel to participate. “All active volunteer members of the Anne Arundel County Fire Department are strongly encouraged to participate in the Wellness/Fitness Initiative” (Williams, 2008, p. 4). Further into the policy reference is made to the exercise program. Section IV.F states, “Participation in the fitness portion of the wellness program is required by all career personnel ... Volunteer personnel are encouraged to participate” (Williams, 2008, p. 8). Chief Williams explained that there was concern about resistance among the volunteer firefighters. “I do not want to say that it was politically untenable but there really is no other way to describe it.” (A. Williams, personal communication, June 16, 2011). Of the 544 volunteer firefighters currently eligible for the WFI,

99%, or approximately 540 volunteer uniformed firefighters, have never participated in the program.

Although the argument could be posited that this is simply a technical problem requiring a technical solution, it would be a mistake to do so. In the *Executive Development* course offered at the National Fire Academy, extensive discussion is held concerning the difference between technical problems and adaptive challenges. In this case, care must be given not to fall into the trap of believing that the Fire Chief of the AACOFD could, by fiat, require all volunteer personnel to begin participating in the WFI and successfully gain their support. Although volunteer firefighters in the system lack the formal authority to resist such orders individually, as a labor group the volunteer firefighters association is uniquely positioned to challenge directives through alternate political channels. Adaptive solutions require that leaders convince individuals that proposed changes are in their best interest without ordering them to change. Individuals become invested in the change when they perceive that the leader cares about what is best for them and that mutual goals are aligned (Linsky & Heifetz, 2002). In this case, the adaptive challenge was identified at the inception of the WFI, evidenced by unwillingness to make the program compulsory for all personnel, and continues today with no change in over four years. The research problem qualifies as an adaptive challenge because the reasons for a lack of participation in a voluntary program are unknown and as a result the potential solutions cannot be readily identified. Section II.F of the WFI identifies the Fire Chief's responsibility:

It is the Fire Chief's responsibility to ensure that excellent customer service for the community is delivered by healthy firefighters with their performance enhanced by an atmosphere of workplace safety, regulatory compliance, and positive attitudes. The WFI is the Chief's commitment to the uniformed personnel's quality of life. Anne Arundel

County Fire Department members who are medically, physically, and mentally fit will provide better service to their communities year after year while realizing reductions in mortality and morbidity (Williams, 2008, p. 6).

In this case, current and future organizational effectiveness is negatively impacted because volunteer uniformed personnel are not required to participate in the WFI, while career personnel are. The goal of the research is to identify barriers (if they exist) and provide recommendations leading to a more consistently heart-healthy uniformed workforce.

This research effort is tied directly to goal 2 as outlined in the United States Fire Administration's Strategic Plan 2010-2014. Goal 2 identifies that fire and emergency medical services personnel form the foundation of local first responders in the management of local emergencies, and that the effectiveness of how an incident is handled is directly related to the preparedness of those responders (United States Fire Administration [USFA], 2010, p. 14).

### **LITERATURE REVIEW**

That the AACOFD has suffered LODD's is not unique. The purpose of this section of the research paper is to evaluate the body of literature on the subject of voluntary participation in annual physicals. This evaluation forms the basis for the research conducted in the next section of the paper and provides a comparative basis to Anne Arundel's experience.

Every year nearly 100 firefighters die in the line of duty and thousands are injured. Among this group the leading cause of death is cardiac-related events (Christiani, Christophi, Kales, & Soteriades, 2007, p. 1207). In its annual study of firefighter fatalities, the United States Fire Administration identifies that 72 firefighters died while on duty in 2010 (United States Fire Administration [USFA], 2011, p. 4). The report also identifies 15 firefighters who qualified in 2010 to be included in the report by virtue of the Hometown Heroes Survivor Benefit Act of

2003, bringing the total for 2010 to 87. In that act, firefighters who suffer a heart attack or stroke within 24 hours of engaging in non-routine stressful activity relating to an emergency response or training are potentially eligible to be included as on-duty fatalities (USFA, 2011, p. 2).

Although 2010 saw the lowest number of on-duty fatalities in 34 years (USFA, 2011, p. 4), the average number of fatalities over the past 10 years (excluding the 343 firefighters killed on 9/11/2001) is 108, including those who qualified under Hometown Heroes.

Most significantly, 57.5% (50) deaths in 2010 were directly attributed to heart attacks (sudden cardiovascular events) (USFA, 2011, p. 16). Of the 50 deaths, 35 occurred among volunteer firefighters and 15 occurred among career firefighters. Further analysis reveals that the percentage of total fatalities attributed to cardiac-related events for career firefighters is 53.6% and 62.5% for volunteer firefighters. No conclusion is drawn herein as to the disparity between the two groups. The purpose of the information is intended to identify that cardiac related LODD's affect both career and volunteer firefighters and that, in 2010, the percentage of volunteer firefighters affected is (8.9%) higher. The experience in the AACOFD is similar to that nationally.

McEvoy (2007) reports that firefighters (without regard for pay status) are actually less likely to suffer a fatal cardiac event than the general population by approximately 10% and yet they are more likely to suffer a cardiac related death (45%) than police officers (22%), emergency medical providers (11%), or general laborers (15%). He goes on to identify that a study conducted at Harvard University reached obvious conclusions when it indicated that every fire department should have a model program to establish a physical fitness baseline for every firefighter coupled with an exercise program predicated on measureable improvement benchmarks (McEvoy, 2007). One of the criticisms of the Harvard study centers on a conclusion

that volunteer firefighters are disproportionately likely to suffer a cardiac related death.

McEnvoy (2007) points out that the researchers failed to evaluate common cardiovascular disease (CVD) risk factors when comparing career and volunteer firefighter fatalities.

A research study conducted by a team at the Saginaw State University concluded that volunteer firefighters showed a larger than expected percentage of two or more CVD risk factors, with three out of every five classified as obese (Fulton, Knous, Lowry, Ode, & Peterson, 2011, p. 771). The research did not compare volunteer firefighters with career firefighters but was able to independently conclude that volunteer firefighters are at risk for CVD and that *perhaps* (emphasis added) this group of firefighters was at least at the same risk as the general population (Fulton et al., 2011, p. 771). If accurate, this research has the potential to contradict the premise that firefighters are healthier than the general population and may indicate the need for additional research specifically focused on volunteer firefighters.

Although the research questions focus on the experience of the AACOFD, the literature review confirmed previously identified beliefs as expressed by Williams (2011) during his interview, “although we hoped that all firefighters would voluntarily see the benefit in participating, we knew that the only way to ensure 100% compliance was to make the program mandatory for all personnel.”

## PROCEDURES

The procedures for completing the applied research project (ARP) began with attendance of the *Executive Development* course at the National Fire Academy (NFA) in January, 2011. At that time, extensive instruction was received concerning the development and completion of the ARP. Brain-storming sessions were held with fellow students in an effort to identify a suitable topic to research. After selecting the topic, a problem statement, purpose statement, and research

questions were developed in draft form. Each draft was reviewed with fellow students and course instructors with a specific focus of continually refining the topic to be researched. It should be noted that this exercise proved extremely valuable in helping the researcher arrive at a sufficiently narrow topic to ensure the greatest likelihood of success. The value of intellectual challenge through constructive interaction with colleagues cannot be overstated.

By the conclusion of the course, the researcher had successfully developed a problem statement, purpose statement, research questions and selected a research method. Time was spent in the Learning Resource Center (LCR) at the NFA reviewing similar ARP's, including a detailed review of reference lists to serve as a foundation for the literature review component of the ARP. Subsequently, the researcher was assigned to an evaluator and contact was made electronically. By mid-February, the proposal for research had been reviewed and returned with an approval to proceed.

Prior to initiating the research effort, the proposal was reviewed with Fire Chief J. Robert Ray who is the current Chief of Department for the AACOFD. Chief Ray is a graduate of the Executive Fire Officer program and is also a graduate of the Harvard University Senior Executive's in State and Local Government program. The research proposal was shown to Chief Ray for two principal reasons. First, the researcher perceived that the issue being addressed had the potential to elevate the level of anxiety among volunteer firefighters who could view the research effort as a pre-cursor to future action. Change does not come easily to the fire service and the perception of altering an existing program could have resulted in Chief Ray being asked direct questions by political leaders concerning the need for such research which had the potential to scuttle the research effort. Second, the researcher wanted to ensure that the ARP was consistent with Chief Ray's vision and strategic goals for the department. Chief Ray is an ardent

supporter and active participant in the WFI and provided valuable guidance in allowing the researcher an opportunity to pursue the research.

In order to ensure completion of each section of the paper, a decision was made to conduct the research in an identical format to the structure of the ARP. Research was conducted into the history of the development of the WFI in Anne Arundel County as well as extensive research surrounding the circumstances of LODD's in the AACOFD. Additional research was conducted in an effort to compare LODD's among volunteer firefighters in the AACOFD with those occurring across the United States.

In order to answer three of the questions, the use of a survey instrument was planned. The researcher contacted Dr. Sara Jahnke, Ph.D., who is the Director and Principal Investigator at the National Development and Research Institute. Dr. Jahnke's assistance in the development of the survey and analysis of the research conducted was critical in its success. It is strongly recommended that similar research conducted by other researchers in this arena contact Dr. Jahnke for support.

An initial draft of the survey was developed by the researcher. The initial draft was shared with Dr. Jahnke who offered several comments and suggestions. The survey was revised four times during development with the exclusion of certain questions originally considered for use. A question that asked the participant to identify their gender was removed after research found that gender-based questions would not have a direct bearing on the outcome of the survey. A question asking the participant's age was specifically designed to allow the direct reporting of an actual age rather than the requirement to select an age range. Research has found that a percentage of respondents may elect not to answer a question if they are asked how old they are or if they are asked to select an age range (Gendall & Healey, 2009, p. 4). Further, questions

concerning tobacco use were considered but eventually discarded because they were beyond the scope of the survey. Additionally, questions concerning participant's weight and height were also considered but discarded. These questions were not included because of concern about the possible chilling effect that asking such questions might have on the likelihood of answering other questions that were considered more germane to the research subject. Extensive discussion was held on the length on the survey (number of questions) and the time required completing the survey. The survey questions were ordered in a specific way to reduce the anxiety associated with completing the survey by asking simple demographic data questions first, followed by increasingly complex questions. The most potentially controversial question was placed as the final question. The final draft of the survey included 14 questions.

The survey was shared with colleagues prior to distribution. First, the survey was shown to the AACOFD Human Resource Manager (Mr. Robert Allwang). This individual was selected because he had over 35 years of experience in a similarly situated combination fire department prior to coming to work for the AACOFD, retiring at the rank of Assistant Chief of Operations in the Montgomery County, Maryland, Department of Fire Rescue Services. He has extensive experience in developing survey instruments and his feedback was valuable in reducing researcher bias identified in the wording of questions.

Second, the survey was shared with a colleague currently enrolled in a graduate program who evaluated the survey for grammar and typographical errors. Finally, the survey was reviewed with a volunteer firefighter from another jurisdiction to assess the ease of navigation and general perceptions and feelings relating to the completion of the instrument.

A commercially available survey instrument company was selected (Survey Monkey) after an evaluation of several competitors. Survey Monkey was selected because it presented the

most cost effective platform that offered the highest level of on-line support coupled with a wide array of downloadable reports based on the data collected. The survey was developed using a Microsoft Word format and the questions were subsequently transferred into the survey instrument. One specific benefit of Survey Monkey was its web-based application allowing the researcher to work with the survey from any computer with internet access. A unique internet link was created for the survey which could be copied and pasted into a variety of correspondence.

Prior to allowing the survey to become live, the researcher contacted the Department's Volunteer Coordinator, Ms. Jackie Olsen. Ms. Olsen was briefed on the subject and intent of the survey. Ms. Olsen was asked to provide the station commanders of volunteer fire stations in the AACOFD with a briefing concerning the survey, its goals, objectives, and intended use. Ms. Olsen agreed and did provide a briefing at the regular meeting of the volunteer station commanders. In addition, Ms. Olsen was able to answer questions concerning the survey while it was in use. It is not known whether any volunteer personnel contacted Ms. Olsen.

A survey group was selected. Within Anne Arundel County there are several classifications of volunteer members. Individuals may belong to a volunteer fire company located within the County and serve in an administrative or non-operational role. Such personnel may not respond on calls for service and may not ride in or operate county-owned apparatus and equipment.

Individuals who wish to be included as volunteer uniformed members for the purpose of responding to calls for service must be identified on the "qualified-to-ride" (QTR) database. The database is the Department's official mechanism to account for volunteer personnel. Volunteer personnel whose name appears on the database must meet extensive requirements in a pre-

membership process including the successful completion of an NFPA pre-entrance physical. There are both initial and continual training requirements to remain on the QTR database. At the time the survey was initiated, the Department had 544 individuals listed on the QTR database.

The researcher elected to use the QTR database as the basis for the survey subject group because it most closely represented those volunteer firefighters who were similarly situated to the career uniformed personnel required participating in the WFI. Additionally, the literature review revealed that physical exertion was a primary contributing factor to sudden cardiac related deaths among firefighters and the QTR database participants met the criteria for such experience.

The researcher then contacted the Department's manager of the QTR database (Mr. Drew Martin) and requested a full listing of all personnel including their first and last name, volunteer fire company affiliation, and county-provided email address. Upon receiving the report in Excel format, it was determined that 297 individuals had a current email address in the County system, while 247 individuals did not have an email address in the County system. There were two main reasons individuals did not have a valid email address: (1) an address had not been assigned; (2) an address had been assigned but had expired from lack of use (note: the County's Information Technology policy dictates that email addresses are de-activated after 60 days of no use).

Immediately prior to releasing the survey for use by the selected participants, a separate introductory correspondence was transmitted electronically from the researcher to all volunteer station commanders (APPENDIX E). The correspondence introduced the purpose of the research and the survey. The researcher requested that each station commander add their support in encouraging their eligible personnel to complete the survey. Each station commander was provided with a list of their personnel for whom an email address was known, as well as for

those whom an email address was not known. Each volunteer fire company has an established mechanism for contacting their members. The researcher asked each volunteer station commander to access their own systems to communicate the importance of completing the survey. Finally, volunteer station commanders were contacted personally by the researcher to reinforce the importance of encouraging their members on the QTR database to complete the survey. Face-to-face communication was the preferred communication medium with volunteer station commanders and when not possible, completed via telephone.

Survey participants for whom an email address was known received electronic correspondence inviting them to participate in the survey. The invitation to participate included a link directing participants to the survey where an introductory message was provided and qualification to participate was confirmed. Several conditions were established in the survey: (1) the survey was completely voluntary and participants could remove themselves from the process at any point simply by navigating away from the on-line website; (2) survey participants were not required to answer any question they chose not to answer; (3) survey participants were provided with resources to obtain additional information concerning the subject matter of the survey at its conclusion, as well as the researcher's contact information if questions or concerns arose during the completion process.

The survey remained open for twenty (20) calendar days. An intermediate reminder was sent to all participants electronically and to all volunteer station commanders explaining that the survey was available to be completed and that the link to the survey could be copied and pasted to achieve increased exposure and access.

There were several limitations in the procedures section. The researcher experienced significant difficulty completing an adequate literature review. The researcher may have relied

too heavily on the internet as a research platform without possessing a command-level knowledge of appropriate strategies to gather information and, as a result, failed to budget adequate time to complete a more thorough review of potentially available literature.

During the data gathering component of the procedures, the researcher was limited to those participants for whom an email address was known. In this experience, 45% of the individuals listed on the QTR database did not have a valid county email address. It is not known how many subjects listed on the database ultimately received the survey.

## **RESULTS**

The National Institute of Occupational Safety and Health (NIOSH) recommends that fire service agencies conduct research that identifies the barriers to implementing health promotion programs, including health and fitness programs to reduce preventable LODD's from sudden cardiac events (Department of Health and Human Services Centers for Disease Control [NIOSH], 2007, p. 4).

In conducting this original descriptive research, it is hoped that the AACOFD can likewise reduce the number of preventable LODD's among its volunteer firefighting force. Significant efforts have been put forth to achieve similar goals among career firefighters however, the disparate treatment of volunteer firefighters interferes with the department's goal of maintaining a healthy workforce. The research results form the basis for the recommendations found later in the ARP for use as a foundation for a more formal discussion with affected stakeholders. The purpose of this section is to answer the research questions by reporting the results of the research.

First, what are the causes of LODD's among volunteer firefighters in the AACOFD compared with national trends in LODD's? Runkles (2002) provided a detailed history of

LODD's in Anne Arundel County. To date, 18 firefighters have lost their lives in the line of duty, 12 who were volunteer firefighters (Runkles, 2002). Although the distribution of causes is split equally between traumatic (9) and medical (9) deaths, the most recent five (5) deaths have been as a result of cardiac related events (Runkles, 2002).

National trends mimic those of the experience in Anne Arundel County. In 2011, the USFA identified the leading cause of death among firefighters as sudden cardiac events, accounting for 57% of all fatalities (50). Extensive research has been conducted by NIOSH and the NFPA to support the postulate that sudden cardiac events pose the greatest risk to firefighters today, regardless of pay status. The National Fallen Firefighters Foundation includes in its *16 Firefighter Life Safety Initiatives* project (a component of the *Everyone Goes Home* program) Initiative 6 to "develop and implement national medical and physical fitness standards that are equally applicable to all firefighters based on the duties they are expected to perform" (<http://www.everyonegoeshome.com/>).

Fulton, et.al. (2011) identified that volunteer firefighters may be at an *increased* (emphasis added) risk for sudden cardiac events over the general population in contrast with Christiani et.al., who identified that firefighters in general actually have a lower risk of sudden cardiac events than the general public. Although additional research needs to be conducted to determine the validity of both studies, the results of the research consistently identify that the leading cause of death for all firefighters, regardless of pay status is sudden cardiac events (NIOSH, 2007, p. 15).

Volunteer firefighters in the AACOFD are aware of the leading cause of LODD's among firefighters. Question 11 of the survey instrument asked firefighters to identify what they believed was the leading cause of death of firefighters. Respondents were given a series of

choices and also had the opportunity to select “other” and enter their own belief in answering the question. 80.8% (126) identified *stress-induced cardiac related events* as the leading cause of death. Among the respondents who selected *other*, entries included:

1. “poor health”
2. “cardiac related events and high blood pressure and not physically fit”
3. “heart attack”
4. “out of shape”
5. “poor general health and the abuse our bodies endure throughout our career”
6. “stress related illnesses, and cancer”
7. “failure to maintain healthy lifestyle; diet, exercise, stress relief programs which lead to cardiac and poor decisions while driving and firefighting”
8. “undertrained members and stupidity”

The second research question asked what the AACOFD has done to implement the WFI for its volunteer firefighters. In his interview, Chief Williams identified that the Health and Safety workgroup consisted of representatives from both career and volunteer firefighter labor groups (A. Williams, personal communication, June 16, 2011). Considerable discussion was held concerning the requirement to make the program mandatory for volunteer firefighters but that effort was abandoned due to a perceived lack of support politically for such action within the Office of the Fire Chief and in the Anne Arundel County Volunteer Firefighters Association (A. Williams, personal communication, June 16, 2011). The final version of the WFI reflects this in its wording, “all active volunteer members ... are strongly encouraged to participate in the Wellness/Fitness Program”(Williams, 2008, p. 4). Beginning in 2008 (when the WFI became mandatory for career firefighters) through the current research effort, no formal marketing

program has been undertaken to encourage participation in the WFI among volunteer firefighters. Between 2008 and 2011, an average of 150-175 new volunteer firefighters have joined the AACOFD while an average of 60-70 volunteer firefighters have left or retired from the AACOFD (J. Olson, personal communication, September 7, 2011). Statistically, this translates into 315 volunteer firefighters serving in the AACOFD that were not serving prior to 2008 which represents a 58% turnover in personnel.

Question 2 of the survey asked how many years (in total) have you been an operational volunteer (responding to calls) with Anne Arundel County. One hundred fifty eight individuals responded to the question and 6 skipped the question. The results reveal that 64 or 40.5% identified that they had been serving 0-5 years in the AACOFD. Among survey respondents, the turnover in volunteer firefighters is consistent with the information provided by Ms. Olson.

Based on the turnover rate, coupled with a lack of formal marketing, one might expect that the knowledge level of the existence of the WFI would be low. Question 3 of the survey asked are you aware that the Anne Arundel County Fire Department (AACOFD) has a formal program relating to health and fitness known as the Wellness-Fitness Initiative. Surprisingly, 123 respondents accounting for 77.4% answered “yes” while 36 (22.6%) answered “no”.

The research appears to demonstrate that despite a lack of a marketing program, a significant percentage of current active volunteer firefighters are at least aware of a program known as the WFI.

Narrowing the focus, Question 3 of the research proposal queried what is the knowledge level of AACOFD volunteer firefighters relating to the WFI? The researcher considered the possibility that volunteer firefighters may be aware of the existence of the WFI as a component of the Department’s Health and Safety program, but that an understanding of its component

parts, most especially relating to the availability of an NFPA 1582 annual physical, might not be known.

Question 4 of the survey sought to evaluate the knowledge level of respondents and asked if they were aware that they are eligible for a free annual physical that is NFPA 1582 compliant as a component of the WFI. 55.3% (88) responded that they were not aware while 44.7% (71) responded that they were aware. A limiting factor in this question relates to the assumption that respondents can articulate the definition of an NFPA 1582 physical which was not assessed in the survey.

Question 5 of the survey asked whether the respondent had ever had a physical through the WFI. 86.8% (138) had never had a physical through the WFI while 21, or 13.2%, had participated. Question 6 identified that among those who had a physical through the program, 19 (90.5%) had participated once and one person participated more than once but not every year since the program's inception. Only one respondent identified that they had participated in the WFI annually, including receipt of an NFPA 1582 physical.

The survey results identify that a slightly higher percentage of volunteer firefighters are unaware of their eligibility to obtain an NFPA 1582 physical. An even greater percentage, crossing into those who were aware of their eligibility, had never obtained an annual NFPA 1582 physical through the WFI.

The most direct evidence answering research Question 3 can be found in the answer to survey Question 8. The question asked: If you have not received an annual physical through the AACOFD WFI what is the primary reason? (Please check one reason). Of the 142 individuals who answered the question, the highest response by 63 people (44.4%) reported that *"until this survey, I was not aware that I was eligible to participate."* An additional 4% (6) of respondents

selected “*Other*” as a response and then indicated that they were not aware that they were eligible for an NFPA 1582 physical. The data indicates that the majority of respondents cite a lack of knowledge as the primary reason for not participating in the WFI.

The survey also sought to answer the fourth research question which was what are the obstacles preventing AACOFD volunteer firefighters from obtaining an annual NFPA 1582 physical as a component of the WFI? The survey offered possible obstacles that the researcher hypothesized could exist, as well as provided respondents with a mechanism to identify others not included in the questions. The responses to survey Questions 4 and 8 showed that a lack of detailed knowledge concerning eligibility to participate is an obstacle.

Unlike Question 8 which limited the respondent’s choice to a single most important reason, question 9 expanded participants’ ability to provide insight into why they have not participated in the WFI and obtained an NFPA 1582 physical. Respondents could choose as many reasons that they believed applied to their circumstances. The two most common reasons (accounting for 73.7% of all responses) cited in descending order were:

1. Until this survey I was unaware that I was eligible to participate .. 41.9% (64)
2. I am unclear about how to access and/or schedule a medical  
physical .....31.8% (41)

A third reason, although not a barrier, explains why a segment of respondents do not participate due to the fact that they receive an NFPA 1582 physical through their employer accounting for 14.0% (18).

The responses reinforce the results in Questions 4 and 8 relating to one barrier. Coupled with a lack of an organized marketing campaign since the inception of the program, and a simultaneous consistent influx of new volunteer firefighters, the primary barriers are revealed.

To a lesser extent, additional reasons were identified, including a belief that the department would prevent a volunteer from serving in an operational capacity if something is found (15). Concerns about confidentiality were found in 12 responses (9.3%), and a belief that the current medical contractor does not have a reliable reputation was offered by 10 respondents (7.9%).

By contrast, a significant number of respondents, 131 or 84%, believe that they could pass an NFPA 1582 physical and 94.9% characterize their health as *good, very good, or excellent*. Both of these questions counter the postulate that a barrier to participation is a self-assessment of poor health or that they could not pass a physical and would therefore be unwilling to participate.

The final question posed in the survey addressed the potential impact of converting the voluntary nature of the WFI for volunteer firefighters to a compulsory program. Table 1 shows the results.

Table 1

*Results Question 14 of Assessing Awareness of Annual Physicals*

---

If the AACOFD made participation in the Wellness-Fitness Initiative mandatory for all personnel including volunteers on the Qualified-to-Ride Database, I would:

Be more likely to continue volunteering in the County	21.3%	33
Be less likely to continue volunteering in the County	7.1%	11
Definitely stop volunteering in the County	0.6%	1
It would have no effect on my decision to volunteer in the County	71.0%	110

---

The results in Table 1 indicate that 92.3% of respondents would either be more likely to continue volunteering in the County (33), or that the decision to make the program mandatory would have no effect on their decision to continue volunteering in the County (110).

## **DISCUSSION**

There is an overwhelming body of literature that chronicles the risks associated with firefighting (NIOSH, 2007) and the leading cause of death among firefighters being sudden cardiac arrest primarily due to stress or overexertion associated with emergency incident operations. Anne Arundel County's experience is consistent with that of fire departments across the United States. On November 12, 1996, Firefighter William R. Chambers collapsed while carrying a patient on a stretcher and died instantly of a massive heart attack (Runkles, 2002). This researcher worked for the AACOFD at the time of Firefighter Chambers' death but did not appreciate the gravity of his loss. Thankfully others did and, in doing so, embarked upon an effort to prevent similar events from occurring. Ten years later in 2006, the Department was awarded an AFG grant of nearly one million dollars leading to the establishment of a WFI in the AACOFD.

Today, there is modern fitness equipment in every fire station in the County and 100% of career uniformed personnel receive an annual NFPA 1582 physical provided by the County, all of which would not have been possible without the acquisition of the AFG grant (A. Williams, personal communication, June 16, 2011).

Notwithstanding these substantial achievements consistent with NFPA 1500, NFPA 1582, the 16 Firefighter Life Safety Initiatives, and recommendations from NIOSH, one segment of the AACOFD remains as at-risk for a sudden cardiac-related death as it did in 1993 when

Firefighter William Overman collapsed on his first structure fire call as a volunteer firefighter (Runkles, 2002).

The research reveals several important points that answer the research questions and achieves the research purpose of identifying why volunteer firefighters are not participating in an annual NFPA 1582 physical provided through the Department-funded WFI. The research problem is important from an organizational, local, and national perspective and presents the researcher with an adaptive challenge. The research is linked to the United States Fire Administration's Strategic Plan in enhancing the preparedness of local responders. This is accomplished in several ways.

First, the research shows that most volunteer firefighters understand and can articulate the leading cause of death of firefighters. This is critical in laying the foundation for behavior modification and/or policy change, however, one limitation of the research is that it failed to ask whether the study group perceived that they specifically were at risk for a sudden cardiac event.

Second, volunteer firefighters in the AACOFD possess what could be characterized as a surface-level understanding of the WFI. Most have heard of the WFI but cannot articulate its components or available benefits. This signals a missed opportunity to promote a program with defined benefits in reducing mortality and morbidity.

Third, the obstacles identified in the research do not match the expected outcomes by the researcher. The researcher expected significant resistance to altering the non-compulsory nature of the program. In addition, the researcher expected a more significant level of anxiety associated with the perceived "non-punitive" nature of the program. It is possible that the successful implementation of the program for uniformed career personnel has formed the foundation for trust within the volunteer uniformed force. That the program has been in place

for three years and no career firefighter has been permanently removed from an operational status may explain the low level of concern expressed in the survey among volunteer firefighters. Fundamentally, volunteer firefighters want to be able to provide service in their communities so it is only natural that anything which threatens that ability is viewed skeptically. Often, the only answer to an irrational fear is time, experience and trust (a function of time).

It is the researcher's opinion that the answers obtained in the survey instrument indicate that the uniformed volunteer firefighting personnel in the AACOFD may be prepared to accept a change in the WFI. Although concerns were expressed, their incidence was statistically insignificant when compared to the expressed support. For the volunteer firefighters whose lives can be saved through participation in the WFI, the potential benefits are quantifiable and substantial.

Organizationally, the AACOFD can benefit from the results of this study in addressing a long-standing weakness in its on-going effort to ensure a healthy, fit, and functionally prepared response workforce. Volunteer firefighters respond alongside career firefighters in an integrated response framework but the organization is only as strong as its least prepared member. Preparation must begin with the first responders who are charged with protecting the citizens living in and traveling through the County.

Concurrently, there are several important limitations to the research that point to a need for further study. The research group that participated in the survey was relatively small with an overall participation level of 30% (164 of 544). Although 97% of those who started the survey completed it, a lack of valid email addresses for 247 of the 544 personnel on the QTR database is concerning. Additional research, including focus groups conducted at each volunteer fire station,

should be conducted. A more detailed review of the data is also warranted in identifying any patterns of perceptions that require correction or alteration through education.

### RECOMMENDATIONS

The Anne Arundel County Fire Department may be in a unique position to significantly enhance its commitment to the health and wellness of its volunteer uniformed firefighters. Although the research results are exciting and point to the possibility of reducing preventable LODD's among volunteer firefighters in Anne Arundel County, it would be a mistake to immediately alter the voluntary nature of the WFI and make it compulsory for volunteer firefighters. The issue of compelling volunteer firefighters to participate in the WFI includes both technical and adaptive challenges. Without stakeholder support, such action could produce sufficient disequilibrium to undermine and eclipse the intent of saving firefighter lives, however noble such a goal might be. Therefore, the following recommendations are made:

1. The Fire Chief should carefully review the research and consider the development of a workgroup consisting of affected stakeholders including leading members of the volunteer firefighting community, the Office of Risk Management, the AACOFD Health and Safety Division, and a representative from the political leadership of the County.
2. Upon approval of the Fire Chief, an educational program should be developed to inform volunteer firefighters of the immediate availability of voluntarily participating in the WFI.
3. The Health and Safety Division of the AACOFD should develop a *Frequently Asked Questions* (FAQ) document that provides specific information relating to procedures for entrance into the WFI by volunteer firefighters.

4. Once empanelled, a goal that meets the criteria of AIM (achievable, important, and measurable) should be developed that establishes a reasonable timetable to increase volunteer firefighter participation in the WFI by whatever means is deemed most appropriate. Sustainability should be a key component of any new strategy.
5. Future researchers should evaluate the effectiveness of any initiatives undertaken as a result of this effort.

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## APPENDIX A

*Survey instrument: Assessing awareness of annual physicals*

### Assessing Awareness of Annual Physicals

#### WELCOME!

This is Battalion Chief Matthew Tobia. If you received the link for this survey, it is because I need your help.

I am conducting research as part of a course that I am enrolled in at the National Fire Academy and your participation is both extremely important and sincerely appreciated.

The survey you are about to participate in is voluntary; takes approximately 5 minutes to complete; and your responses are anonymous. Additionally, you have the right to withdraw your participation at any time if you desire to do so. Finally, you may simply leave any question blank that you do not feel comfortable answering.

Thanks in advance for taking the time to complete the survey. You will receive a message at the end of the survey with additional information.

Two important points as you begin:

1. This survey is intended for volunteers who are currently listed on the Qualified to Ride Database in Anne Arundel County. If you are not currently on the database, you should not complete the survey.
2. Please complete the survey only once so that the results are as accurate as possible.

#### 1. What is your current age (in years)?

#### 2. How many years (in total) have you been an operational volunteer (responding to calls) with Anne Arundel County?

0-5 years

6-10 years

11-15 years

16-20 years

21-25 years

26-30 years

31+ years

<b>Assessing Awareness of Annual Physicals</b>	
<b>3. Are you aware that the Anne Arundel County Fire Department (AACOFD) has a formal program relating to health and fitness known as the Wellness-Fitness Initiative?</b>	<input type="radio"/> Yes <input type="radio"/> No
<hr/>	
<b>4. Are you aware that you are eligible for a free annual physical that is NFPA 1582 compliant as a component of the Wellness Fitness Initiative?</b>	<input type="radio"/> Yes <input type="radio"/> No
<hr/>	
<b>5. Have you ever received an annual physical through the Wellness-Fitness Initiative?</b>	<input type="radio"/> Yes <input type="radio"/> No
<hr/>	
<b>6. How many times have you received an annual physical through this program?</b>	<input type="radio"/> Once <input type="radio"/> More than once but not every year <input type="radio"/> Every year since its inception
<hr/>	
<b>7. Did you receive an initial physical during the application process to become a volunteer member in Anne Arundel County?</b>	<input type="radio"/> No <input type="radio"/> Yes - Specify Year (eg 2006) <input type="text"/>
<hr/>	

**Assessing Awareness of Annual Physicals**

**8. If you have not received an annual physical through the AACOFD Wellness-Fitness Initiative, what is the primary reason? (Please check ONE REASON)**

- I receive an NFPA 1582 physical through my employer
- I do not believe I need one
- I believe that the department will prevent me from serving as an operational volunteer if something is found
- I do not have time to get an annual physical
- The contract provider is inconveniently located
- I don't like going to doctors
- I am concerned they will identify a problem
- I am concerned about the confidentiality of my test results
- I am unclear about how to access and/or schedule a medical physical
- Until this survey, I was unaware that I was eligible to participate
- I do not believe that the contract provider has a reliable reputation
- Other (please specify)

**Assessing Awareness of Annual Physicals**

**9. What other reasons describe your circumstances or feelings for not completing an annual physical through the Department's Wellness-Fitness Initiative? (Please check ALL THAT APPLY)**

- I receive an NFPA 1582 physical through my employer
- I do not believe I need one
- I believe that the department will prevent me from serving as an operational volunteer if something is found
- I do not have time to get an annual physical
- The contract provider is inconveniently located
- I don't like going to doctors
- I am concerned they will identify a problem
- I am concerned about the confidentiality of my test results
- I am unclear about how to access and/or schedule a medical physical
- Until this survey, I was unaware that I was eligible to participate
- I do not believe that the contractor provider has a reliable reputation
- Other (please specify)

**10. Do you believe you could pass an NFPA 1582 compliant physical?**

- Yes
- No
- Don't Know / Not Sure

**11. What do you believe is the leading cause of death of firefighters?**

- Motor vehicle collisions
- Stress-induced cardiac-related events
- Disorientation: running out of air inside a burning building
- Structural collapse of a burning building
- Other (please specify)

**Assessing Awareness of Annual Physicals**

**12. In general, would you say your health is:**

- Excellent
- Very Good
- Good
- Fair
- Poor

**13. About how long has it been since you last visited a doctor for a routine physical? (A routine physical is a general physical exam, not an exam for a specific injury, illness, or condition. This includes general physical exams initiated by you, required by your employer, or the fire department and performed by a physician or similar health care provider.)**

- Within the past year (anytime less than 12 months ago)
- More than one but less than two years ago
- More than two but less than five years ago
- More than five years ago
- Don't know/not sure
- Never

**14. If the AACOFD made participation in the Wellness-Fitness Initiative mandatory for all personnel including volunteers on the Qualified-to-Ride Database, I would:**

- Be more likely to continue volunteering in the County
- Be less likely to continue volunteering in the County
- Definitely stop volunteering in the County
- It would have no effect on my decision to volunteer in the County

APPENDIX B

Survey results: Assessing awareness of annual physicals

**Assessing Awareness of Annual Physicals**



1. What is your current age (in years)?	
	<b>Response Count</b>
	161
<b>answered question</b>	<b>161</b>
<b>skipped question</b>	<b>3</b>

2. How many years (in total) have you been an operational volunteer (responding to calls) with Anne Arundel County?		Response Percent	Response Count
0-5 years		40.5%	64
6-10 years		18.4%	29
11-15 years		12.0%	19
16-20 years		7.0%	11
21-25 years		9.5%	15
26-30 years		6.3%	10
31+ years		6.3%	10
<b>answered question</b>			<b>158</b>
<b>skipped question</b>			<b>6</b>

**3. Are you aware that the Anne Arundel County Fire Department (AACOFD) has a formal program relating to health and fitness known as the Wellness-Fitness Initiative?**

		Response Percent	Response Count
Yes		77.4%	123
No		22.6%	36
answered question			159
skipped question			5

**4. Are you aware that you are eligible for a free annual physical that is NFPA 1582 compliant as a component of the Wellness Fitness Initiative?**

		Response Percent	Response Count
Yes		44.7%	71
No		55.3%	88
answered question			159
skipped question			5

**5. Have you ever received an annual physical through the Wellness-Fitness Initiative?**

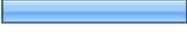
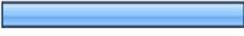
		Response Percent	Response Count
Yes		13.2%	21
No		86.8%	138
answered question			159
skipped question			5

6. How many times have you received an annual physical through this program?			
		Response Percent	Response Count
Once		90.5%	19
More than once but not every year		4.8%	1
Every year since its inception		4.8%	1
answered question			21
skipped question			143

7. Did you receive an initial physical during the application process to become a volunteer member in Anne Arundel County?			
		Response Percent	Response Count
No		21.7%	34
Yes - Specify Year (eg 2008)		78.3%	123
answered question			157
skipped question			7

8. If you have not received an annual physical through the AACOFD Wellness-Fitness Initiative, what is the primary reason? (Please check ONE REASON)			
		Response Percent	Response Count
I receive an NFPA 1582 physical through my employer		12.7%	18
I do not believe I need one		1.4%	2
I believe that the department will prevent me from serving as an operational volunteer if something is found		4.9%	7
I do not have time to get an annual physical		2.1%	3
The contract provider is inconveniently located		1.4%	2
I don't like going to doctors		2.1%	3
I am concerned they will identify a problem		0.0%	0
I am concerned about the confidentiality of my test results		0.7%	1
I am unclear about how to access and/or schedule a medical physical		8.5%	12
<b>Until this survey, I was unaware that I was eligible to participate</b>		<b>44.4%</b>	<b>63</b>
I do not believe that the contract provider has a reliable reputation		0.0%	0
Other (please specify)		21.8%	31
<b>answered question</b>			<b>142</b>
<b>skipped question</b>			<b>22</b>

**9. What other reasons describe your circumstances or feelings for not completing an annual physical through the Department’s Wellness-Fitness Initiative? (Please check ALL THAT APPLY)**

		Response Percent	Response Count
I receive an NFPA 1582 physical through my employer		14.0%	18
I do not believe I need one		3.9%	5
I believe that the department will prevent me from serving as an operational volunteer if something is found		11.6%	15
I do not have time to get an annual physical		8.5%	11
The contract provider is inconveniently located		4.7%	6
I don't like going to doctors		3.9%	5
I am concerned they will identify a problem		3.1%	4
I am concerned about the confidentiality of my test results		9.3%	12
I am unclear about how to access and/or schedule a medical physical		31.8%	41
<b>Until this survey, I was unaware that I was eligible to participate</b>		41.9%	54
I do not believe that the contractor provider has a reliable reputation		7.8%	10
Other (please specify)		13.2%	17
		<b>answered question</b>	<b>129</b>
		<b>skipped question</b>	<b>35</b>

<b>10. Do you believe you could pass an NFPA 1582 compliant physical?</b>			
		Response Percent	Response Count
Yes		84.0%	131
No		1.3%	2
Don't Know / Not Sure		14.7%	23
answered question			156
skipped question			8

<b>11. What do you believe is the leading cause of death of firefighters?</b>			
		Response Percent	Response Count
Motor vehicle collisions		11.5%	18
<b>Stress-induced cardiac-related events</b>		80.8%	126
Disorientation: running out of air inside a burning building		0.0%	0
Structural collapse of a burning building		2.6%	4
Other (please specify)		5.1%	8
answered question			156
skipped question			8

**14. If the AACOFD made participation in the Wellness-Fitness Initiative mandatory for all personnel including volunteers on the Qualified-to-Ride Database, I would:**

		Response Percent	Response Count
Be more likely to continue volunteering in the County		21.3%	33
Be less likely to continue volunteering in the County		7.1%	11
Definitely stop volunteering in the County		0.6%	1
It would have no effect on my decision to volunteer in the County		71.0%	110
answered question			155
skipped question			9

**or the fire department and performed by a physician or similar health care provider.)**

		Response Percent	Response Count
Within the past year (anytime less than 12 months ago)		59.2%	93
More than one but less than two years ago		22.3%	35
More than two but less than five years ago		15.3%	24
More than five years ago		1.3%	2
Don't know/not sure		1.3%	2
Never		0.6%	1
answered question			157
skipped question			7

## APPENDIX C

*Introductory Message in survey instrument*

This is Battalion Chief Matthew Tobia. If you received the link for this survey, it is because I need your help.

I am conducting research as part of a course that I am enrolled in at the National Fire Academy and your participation is both extremely important and sincerely appreciated.

The survey you are about to participate in is voluntary; takes approximately 5 minutes to complete; and your responses are anonymous. Additionally, you have the right to withdraw your participation at any time if you desire to do so. Finally, you may simply leave any question blank that you do not feel comfortable answering.

Thanks in advance for taking the time to complete the survey. You will receive a message at the end of the survey with additional information.

Two important points as you begin:

1. This survey is intended for volunteers who are currently listed on the Qualified to Ride Database in Anne Arundel County. If you are not currently on the database, you should not complete the survey.
2. Please complete the survey only once so that the results are as accurate as possible.

## APPENDIX D

*Conclusion message in survey instrument*

Thank you for completing this survey!

If you have any questions relating to this survey, please contact the researcher, Battalion Chief

Matthew Tobia, at [fdtobia@aacounty.org](mailto:fdtobia@aacounty.org) or 443-871-8324.

If you would like more information about participating in the AACOFD Wellness-Fitness

Initiative please contact the Health and Safety Division at 410-222-8304.

If you would like more information about getting help in becoming healthier, please contact the

County's EAP program at 1-800-765-3277. This service is free to all personnel including  
volunteer members.

## APPENDIX E

*Email correspondence to volunteer station commanders (all)*

**From:** Matthew Tobia  
**To:** Volunteer Station Commanders  
**CC:** Larsen, Joseph; Larsen, Joseph  
**Date:** 9/9/2011 3:41 PM  
**Subject:** Request for Assistance

Chiefs -

I am writing to ask for your assistance. I am currently enrolled in a program at the National Fire Academy for which I am conducting some research. The research is focused on Awareness of the Wellness-Fitness Initiative among volunteer firefighters in the AACOFD. I have designed and created a survey for all Anne Arundel County Volunteer Fire Fighters (at all ranks) who are currently listed on the Qualified to Ride database.

Every individual on the database for whom I have a Groupwise email address will be receiving an invitation to participate in the survey. Participation is completely voluntary and all responses are anonymous. Unfortunately, there are many individuals who do not have a valid Groupwise email address. If you would like a listing of individuals who do not have a Groupwise account, please let me know and I will send you that information.

**Here is the help that I need:** It is my understanding that many, if not all, of you have an alternate electronic mechanism (text messaging, personal email address list serv, etc) by which you transmit important information to your members. I would sincerely appreciate it if you could please ask all of your riding database operational members to check their groupwise accounts immediately and complete the survey. For those without groupwise accounts, please feel free to copy the link for the survey and send it as part of your message to your personnel. All personnel should complete the survey once.

The link to the web-based survey is:

<https://www.surveymonkey.com/s/QZVJBF9>

Thanks in advance for your assistance and support. If any of you have any questions concerning this correspondence, the survey, or the research I am conducting please do not hesitate to give me a call on my cell phone at 443-871-8324 or shoot me a quick email at [fdtobia@aacounty.org](mailto:fdtobia@aacounty.org). I would like to collect as many responses to the survey as possible by September 17th.

Best Regards ~

Matt.

**From:** Matthew Tobia  
**To:** Volunteer Station Commanders  
**CC:** Larsen, Joseph  
**Date:** 9/19/2011 3:56 PM  
**Subject:** Request for Assistance - IMPORTANT - PLEASE READ

Chiefs -

On September 9th, I distributed an announcement concerning a survey as part of a research project I am conducting at the NFA. To date, 105 volunteers in the County have completed the survey and I am extremely grateful to those who have done so. There are, however, over 500 members who are eligible which means that only about 20% have completed the survey. This is a good number but I genuinely need more responses to validate the data. My original deadline was September 17th however I can extend it by a few days in the hopes of maximizing the responses. I know that many of you have already distributed this but any help is sincerely appreciated.

**Here is the help that I need:** It is my understanding that many, if not all, of you have an alternate electronic mechanism (text messaging, personal email address list serv, etc) by which you transmit important information to your members. I would sincerely appreciate it if you could please ask all of your riding database operational members to check their groupwise accounts immediately and complete the survey. For those without groupwise accounts, please feel free to copy the link for the survey and send it as part of your message to your personnel. All personnel should complete the survey once.

The link to the web-based survey is:

<https://www.surveymonkey.com/s/QZVJBF9>

Thanks in advance for your assistance and support. If any of you have any questions concerning this correspondence, the survey, or the research I am conducting please do not hesitate to give me a call on my cell phone at 443-871-8324 or shoot me a quick email at [fdtobia@aacounty.org](mailto:fdtobia@aacounty.org). I would like to collect as many responses to the survey as possible by September 17th. My final deadline for the survey is September 21.

Best Regards ~

Matt.

## APPENDIX F

*Correspondence to survey participants (all)*

**From:** Matthew Tobia  
**To:** QTR Database Survey Participants  
**Date:** 9/9/2011 4:02 PM  
**Subject:** IMPORTANT - Request for Assistance from BC Matthew Tobia

This is Battalion Chief Matthew Tobia and I am writing to ask for your assistance on an important time-sensitive matter. I am conducting research as part of a course that I am enrolled in at the National Fire Academy. As a component of the research, I have created a survey and am respectfully requesting your participation which is both extremely important and sincerely appreciated.

The survey is voluntary; takes approximately 5 minutes to complete; and your responses are anonymous. Additionally, you have the right to withdraw your participation at any time if you desire to do so. Finally, you may simply leave any question blank that you do not feel comfortable answering.

Thanks in advance for taking the time to complete the survey. You will receive additional information after completing the questionnaire. Two important points as you begin:

1. This survey is intended for volunteers who are currently listed on the Qualified to Ride Database in Anne Arundel County. If you are not currently on the database, you should not complete the survey.
2. Please complete the survey only once so that the results are as accurate as possible.

Click on this link which will take you to the survey:

<https://www.surveymonkey.com/s/QZVJBF9>

If you have any questions concerning completion of the survey, the information contained in it, or the research that I am conducting, please do not hesitate to contact me via email at [fdtobia@aacounty.org](mailto:fdtobia@aacounty.org) or via cell at 443-871-8324. I apologize in advance if you receive a request to participate more than once as I have asked your Station Commanders to also communicate this information in an effort to maximize the number of participants.

Thanks again and please be safe!

**From:** Matthew Tobia  
**To:** QTR Database Survey Participants  
**CC:** Matthew Tobia  
**Date:** 9/19/2011 3:46 PM  
**Subject:** REMINDER - Request for Assistance from BC Tobia

On September 9th, I distributed information concerning a survey that I am conducting as part of a research project at the National Fire Academy. To date, over 105 members on the Qualified to Ride Database have completed the survey - THANK YOU! However, there are over 500 members listed on the database and your help is urgently needed.

The survey is voluntary; takes approximately 5 minutes to complete; and your responses are anonymous. Additionally, you have the right to withdraw your participation at any time if you desire to do so. Finally, you may simply leave any question blank that you do not feel comfortable answering.

Thanks in advance for taking the time to complete the survey. You will receive additional information after completing the questionnaire. Two important points as you begin:

1. This survey is intended for volunteers who are currently listed on the Qualified to Ride Database in Anne Arundel County. If you are not currently on the database, you should not complete the survey.
2. Please complete the survey only once so that the results are as accurate as possible.

Click on this link which will take you to the survey:

<https://www.surveymonkey.com/s/QZVJBF9>

If you have any questions concerning completion of the survey, the information contained in it, or the research that I am conducting, please do not hesitate to contact me via email at [fdtobia@aacounty.org](mailto:fdtobia@aacounty.org) or via cell at 443-871-8324. I apologize in advance if you receive a request to participate more than once as I have asked your Station Commanders to also communicate this information in an effort to maximize the number of participants.

Thanks again and please be safe!

## APPENDIX G

*AACOFD Wellness Fitness Initiative*

*John Leopold, County Executive*  
*David Stokes, Fire Chief*

October 11, 2007

To All Members of the Anne Arundel County Fire Department,

We want to take this opportunity to welcome you to the Anne Arundel County Wellness and Fitness Initiative.

This program is the result of a collective effort including Fire Department Administration, the Professional Fire Officers Association, IAFF Local 1563 and the Volunteer Firefighters Association.

Our goal is to implement a positive, individualized, non-punitive program that will improve the quality of life for all personnel. All results will be measured against an individual's previous examinations and assessments and not against any standard or norm. Confidentiality of medical information is a critical aspect of the program. We will be able to demonstrate the value of investing wellness resources over time to maintain fit, healthy and capable personnel throughout their career using aggregate data collection.

Although participation for personnel hired prior to 07/01/04 will be initially voluntary, we hope that each of you will become a part of the program at your earliest opportunity.

Sincerely,

---

David Stokes, Fire Chief  
A.A.Co.F.D. Fire Chief

---

Craig Oldershaw, President  
A.A.Co. Professional Fire Fighters  
IAFF Local 1563

---

Craig Harman, Acting President  
A.A.Co. Volunteer FF Association

---

Julian Jones, President  
Professional Fire Chief's Association

# WELLNESS/FITNESS INITIATIVE (WFI)

*Established 7/01/07*

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## I. PURPOSE/SCOPE

### I.A. Purpose

This Wellness/Fitness Program will enable the workforce of the Anne Arundel County Fire Department to improve their health and fitness through a comprehensive plan tailored to their needs. This plan will allow all members of the workforce to participate in the Vision Statement of the Anne Arundel County Fire Department which states, "our mission will be accomplished by a physically fit and healthy workforce, empowered with a high level of involvement in our success."

### I.B. Scope

#### I.B.1. Career Employees

1.B.1.a. For employees hired after July 1, 2004, participation in the Wellness/Fitness Program will be mandatory upon the implementation of this program. The results of the program will be non-punitive in nature.

1.B.1.b. For employees hired before July 1, 2004, participation in the Wellness/Fitness Program will be voluntary for one year. Beginning August 20, 2008, the program will be mandatory. The results of the program will be non-punitive in nature.

#### I.B.2. Volunteer Members

All active volunteer members of the Anne Arundel County Fire Department are strongly encouraged to participate in the Wellness/Fitness Program upon implementation.

## II. BACKGROUND

II.A. The issue of firefighters and fitness gained global attention with the publication of the 1997/2000 Fire Service Joint Labor and Management Wellness-Fitness Initiative (WFI). Ten major fire departments in the U.S. and Canada contributed to the Initiative. The International Association of Professional Firefighters (IAFF) and the International Association of Fire Chiefs (IAFC) in Washington, D.C., developed the WFI and both organizations encouraged all fire departments to implement the guidelines. The ultimate goal of the comprehensive Fire Service Joint Labor Management Wellness-Fitness Initiative is to improve quality of life for all uniformed personnel. The Initiative will be implemented as a positive individualized program that is non-punitive.

II.B. On November 12, 1996, William (Willie) Chambers died in the line of duty. He died of undiagnosed heart disease, the number one killer of all firefighters. Engineman Chambers is one of five firefighters in Anne Arundel County to die of similar conditions since 1986. To address the physical fitness of our members and their mental well-being, the Anne Arundel County Fire Department established a Wellness and Fitness

Workgroup. The workgroup consists of representatives from all labor and management groups including:

- Health and Safety Division

- Professional Fire Chiefs Association
- International Association of Firefighters, Local 1563
- Volunteer Firefighters Association
- Office of Risk Management
- Office of Personnel

II.C. The workgroup thoroughly reviewed and discussed the Joint Wellness/Fitness Initiative (IAFC/IAFF), NFPA 1582 (Medical), NFPA 1583 (Fitness) and conducted considerable research on implementation activities of other fire departments in the United States. Research included:

II.C.1. Visiting the Wellness Center at Montgomery County, Maryland.

II.C.2. Visiting the fire department complex in Prince William, Virginia.

II.C.3. Visiting facilities in the City of Annapolis, Maryland.

II.C.4. Attending the Wellness Symposium in Phoenix, Arizona.

II.C.5. Captain Kenneth Harrison of the Orange County Fire Department in California spoke to a majority of our Deputy and Division Chiefs about their WEFIT Program. Orange County is similar in size to Anne Arundel County and has experienced reductions due to numerous physical/medical risk factors amongst its members.

II.C.6. Submitting a grant through Homeland Security for nearly \$1 million to help fund the initial startup costs of this program.

II.D. The grant was received on 11/3/06 and the program was initiated on 8/20/07.

II.E. The Anne Arundel County Fire Chief, the Professional Fire Chiefs Association, the Anne Arundel County Professional Firefighters, Local 1563, and the Anne Arundel County Volunteer Firefighters Association have formed a partnership to ensure that each member has the opportunity to attain and maintain a healthy body and mind to enhance the performance of their duties.

II.F. It is the Fire Chief's responsibility to ensure that excellent customer service for the community is delivered by healthy firefighters with their performance enhanced by an atmosphere of workplace safety, regulatory compliance, and positive attitudes. The WFI is the Chief's commitment to the uniformed personnel's quality of life. Anne Arundel County Fire Department members who are medically, physically, and mentally fit will provide better service to their communities year after year while realizing reductions in mortality and morbidity.

III. OVERALL GOALS OF PROGRAM – While they may change following periodic assessments of the program, the initial goals of the program include the following:

III.A. Reduce risks of sudden cardiac deaths (#1 firefighter cause of death).

III.B. Reduce risks of back injuries (#1 body part injured).

III.C. Reduce strains/sprains (#1 type of injury).

III.D. Increase awareness and provide opportunities for improvement in the individual's

level of wellness and fitness.

#### IV. PROGRAM COMPONENTS

##### IV.A. The Medical Evaluation will:

IV.A.1. Provide firefighters with early disease detection, disease prevention and health promotion.

IV.A.2. Detect patterns of disease indicative of work-related problems.

IV.A.3. Monitor the effects of exposure to specific biological, physical and chemical agents.

IV.A.4. Detect changes in a firefighter's health related to harmful working conditions.

IV.A.5. Occupational medical evaluations will be conducted annually.

IV.A.6. Exams are conducted in compliance with NFPA 1582.

IV.A.7. Exams are confidential.

IV.A.8. Results are reviewed with a doctor.

IV.A.9. Members will be provided written feedback concerning risk and health status.

IV.A.10. Results are non-punitive.

IV.A.11. It shall be acceptable for all components of the annual medical evaluation to be performed by a member's private physician, provided full results are forwarded in the required time frame to the contract medical provider.

##### **IV.A.12. TESTS FOR ILLEGAL DRUGS AND ALCOHOL ARE OUTSIDE THE SCOPE OF THIS PROGRAM.**

IV.B. Hazardous materials team members receive within one year of participation on the team, annually, and when leaving the team a hazardous material member exam which will meet the requirements of NFAP 1582, Standard on Medical Requirements for Fire Fighters.

IV.C. Immunizations – Immunizations are available to all personnel through the fire department include the following:

- Hepatitis A
- Hepatitis B
- Tetanus Diphtheria
- Measles, Mumps and Rubella (MMR), upon request
- Polio
- Influenza, annually
- Varicella (chicken pox)

IV.D. Infectious Disease Screening – Infectious disease screenings available to all personnel through the fire department include the following:

- Hepatitis B Antibody Titer
- Tuberculosis Skin Test, annual
- Hepatitis C, baseline and every five years

- HIV

#### IV.E. The Fitness Assessment

IV.E.1. Health Risk Assessment – Written feedback to the members concerning their risks and health status will be provided following the examination.

IV.E.1.a. Reporting findings, risks and suggesting plans for modifying these risks helps the firefighter take a more direct role in his/her health and fitness.

IV.E.1.b. Individualized health risk assessments include questions that attempt to measure the firefighter's perception of his/her health and fitness.

IV.E.1.c. Health perception can be a useful indicator of potential problems.

IV.E.2. The fitness assessment will be completed to determine an individual's aerobic capacity, muscular strength, muscular endurance and flexibility.

IV.E.3. Results will be non-punitive.

IV.E.4. A wellness plan specific to the individual's needs will be developed by a Peer Fitness Trainers.

IV.E.5. The Fitness Program Coordinator will be available to assist with the specific plans for special populations.

#### IV.F. Exercise Program

IV.F.1. Participation in the fitness portion of the wellness program is required by all career personnel, unless excused by their Deputy Chief. Volunteer personnel are encouraged to participate.

IV.F.2. An individual's exercise program should be completed once each shift for those on shift work. Those not assigned to shift work and required by their Deputy Chief to participate should complete it three times a week.

IV.F.3. Access to fitness equipment will be made available to all personnel.

IV.F.4. Off duty personnel may use exercise equipment at any outfitted station.

IV.F.5. Individual access to exercise equipment time and location will be determined by the Bureau Deputy Chief and/or their designee.

IV.F.6. Risk management will cover departmental employees injuries sustained at fire department facilities.

IV.F.7. Exercise programs and orientations to equipment are available through Peer Fitness Trainers.

IV.F.8. Personal exercise programs can be custom designed to fit an individual's fitness and wellness goals.

IV.F.9. Class C uniform or optional fitness clothing as described in RR 7 (Uniforms) and personally purchased appropriate athletic footwear shall be worn while participating in the fitness program.

#### IV.G. Data

IV.G.1. The aggregate data, unrelated to a specific individual, will be gathered from the contract medical provider. No specific information will be released to the Fire Department.

IV.G.2. All employees and volunteer members have a medical information file with is confidential. This information is composed of an immunization record, respiratory protection questionnaire, and exposure history. Per OHSA's 29 CFR 1910.1020. Access to Employee Medical Records, employees/members can request to view their confidential medical file. Individuals who wish to view his/her file can contact the Infection Control Officer in the Department's Health and Safety Division during regular business hours.

IV.G.3. An individual's request for the release of medical records to a third party will be honored only with written consent. The following procedure shall be followed for the release of all confidential medical information.

IV.G.3.a. A written request shall be made to the Department's Infection Control Officer.

IV.G.3.b. Upon receipt of a written request from an individual, the Department's Infection Control officer shall copy the requested information and prepare the documents for pick up or mail. All confidential medical information will be addressed to the employee/member making the request. Upon receipt of the information, the employee/member may release their own medical information to the third party.

#### IV.H. Rehabilitation

IV.H.1. National statistics indicate the frequency of fire fighter injuries is far greater than private industry. It is imperative that rehabilitation become a priority. It is not unusual for a back or knee injury to exceed thousands of dollars, not to mention the mental anguish suffered by fire fighters and their families.

IV.H.2. Alternate Duty Program (Light Duty) - See the Administration Section of the Departmental Rules and Regulations.

IV.H.3. Injury Prevention Program (Injury Analysis Review Board)

IV.H.3.a. The purpose of the Injury Review Board is to review the causes of injuries, exposures and illnesses in order to recommend actions that may reduce the risk of a recurrence.

IV.H.3.b. The Board shall be chaired by a representative from the Health and Safety Division, and consist one (1) representative from each group represented in the Wellness program and Risk Management.

IV.H.3.c. Analysis Procedure:

IV.H.3.c.2. The Chair of the Board will screen the reports to determine those that merit review.

IV.H.3.c.3. Notifications will be made for a Injury Review Board Meeting.

IV.H.3.c.4. The injured person will meet with the Board members to describe the sequence of events or condition that they believe caused the injury, illness or exposure.

IV.H.3.c.5. Information regarding the member's medical condition should not be sought; rather the focus of the inquiry is to determine the cause and whether it is capable of correction or not.

IV.H.3.c.6. The interview should be non threatening and be "fact based", not "fault based".

IV.H.3.c.7. The Board will determine whether the incident was "Preventable" or "Non Preventable".

IV.H.3.c.8. The Board will communicate findings and recommendations regarding any actions that may reduce the risk of a recurrence to those who have the authority to take the recommended corrective actions.

IV.H.3.c.9. A summary report of each meeting shall be forwarded to the Chief of the Department.

IV.H.4. On a periodic basis, the Chair and the Board will prepare communications for all stations to address what actions should be taken or avoided to educate other members how best to avoid or reduce the risk of injuries, illnesses or exposures.

## V. PROGRAM MANAGEMENT

V.A. The Division Chief of Health/Safety serves as the program manager and has general oversight responsibility for the program and will;

V.A.1. Serve as the chairperson for the Health/Fitness Workgroup.

V.A.2. Develop guidelines for liaison activity between Risk Management, the medical provider and the Office of Personnel.

V.A.3. Manage the grant award and facilitate all amendments, reporting requirements and requests for payments from the federal government.

V.A.4. Supervise the Fitness Program Coordinator.

V.A.5. Oversee and approve policies, procedures and program manual development.

V.A.6. Evaluate the program, loss control analysis, and cost effectiveness.

V.A.7. Schedule the medical examinations and fitness assessments.

V.A.8. Prepare the Safety Division's budget for the continuation of the WFI Program.

V.B. A Wellness/Fitness Workgroup as defined earlier in Section II.B. will be maintained to provide guidance on WFI issues. The purpose of the workgroup is to establish a system for ensuring members participate in and benefit from the applicable program components. The group also establishes and monitors goals as identified in Section III. Responsibilities include:

- Establish goals for the program
- Monitor participation
- Prepare program progress reports and analysis.

V.C. Fitness Program Coordinator

V.C.1. Under the direction of the Division Chief of Health and Safety, the Fitness Program Coordinator will participate in planning, development, implementation, and maintenance of the fitness component of the Wellness/Fitness Initiative.

V.C.2. The Fitness Program Coordinator will possess thorough knowledge of human anatomy and physiology, general experience in fitness assessment and testing, ability to present conclusive information based on medical evaluations with regard to executing fitness activities, understanding of the nature of firefighting and EMS demands, assists in decision making and prepares recommendations for injury prevention measures within training programs, administration and management skills and program development skills.

V.C.3. The Fitness Program Coordinator will demonstrate through lifestyle choices a commitment to wellness and fitness and will be expected to participate in familiarization evolutions and may be required to undergo a physical examination.

V.C.4. Supervises Peer Fitness Trainers.

V.C.5. Assist with the education, marketing, and participation in the program.

V.C.6. Assist in the development of program evaluation tools to monitor program results.

V.C.7. Monitor and enhance the flexibility, muscular strength, endurance, aerobic capacity and other factors pertaining to the physical demands of a firefighter.

V.C.8. Coordinate and develop a schedule of medical exams and fitness assessments. Develop and implement a medical appointment schedule process with the contract medical provider and firefighters.

V.C.9. Assist and coordinate with Risk Management the program evaluation activities and project status reports.

V.C.10. Assist in development and implementation of safety training, ergonomics, back care, and other safety topics indicated by the data collected.

V.C.11. Maintain database of programs to identify trends in wellness and fitness.

V.C.12. Attend meetings required to promote the WFI, such as, but not limited to station visits and the Safety and Occupational Health Committee.

## V.D. Peer Fitness Trainers

V.D.A. Selected individuals will receive specialized training and education and will be required to pass certification exams.

V.D.B. These personnel will act as liaisons between the firefighters and the Fitness Program Coordinator to promote increased fitness through participation in individual fitness assessments and program design, demonstration of proper exercise techniques, and safe and proper use and care of exercise equipment.

## V.E. Contract Medical Provider

V.E.1. Perform physicals in full compliance with NFPA 1582. See Appendix A.

V.E.2. The contract medical provider and has developed a unique understanding of the firefighter occupation and related injuries and illnesses.

V.E.3. Other County contracted occupational medical services, such as workers compensation return-to-work evaluations, will continue to be provided at other contract medical providers.

V.E.4. The Wellness/Fitness contract medical provider will **NOT** use the physical exam or fitness assessment to:

- Evaluate general fitness-for duty
- Determine whether any injury or condition may be work-related.
- Serve as a Hazardous Material Physical
- Evaluations concerning fitness for duty in general (other than immediate potential health risks) and workers compensation will continue to be handled using current protocols.

## V.F. Risk Management

Provides the Division Chief of Health and Safety with data on injuries both career and Volunteer.

## VI. COMPONENTS OF THE ANNUAL OCCUPATIONAL MEDICAL EVALUATION FOR MEMEBERS.

VI.A. Purpose - the purpose of the annual occupational medical evaluation of members includes the following:

VI.A.1. Identifying conditions that interfere with a member's physical or mental ability to safely perform essential job tasks without undue risk of harm to self or others.

VI.A.2. Monitoring the effects of exposure to specific biological, physical, or chemical agents on individual members.

VI.A.3. Detecting changes in a member's health that can be related to harmful working conditions.

VI.A.4. Detecting patterns of disease or injury occurrence in the workforce that could indicate underlying work-related problems.

VI.A.5. Providing members with information about their current health, promoting wellness, and referring them for appropriate further evaluation and treatment.

VI.A.6. Providing members with information and education about occupational hazards.

VI.A.7. Providing a cost-effective investment in work-related disease prevention, early detection, and health promotion for members.

VI.A.8. Complying with federal and state requirements.

#### VI.B. Medical History

VI.B.1. A medical history questionnaire shall be completed by each member at each physical exam to provide baseline information with which to compare future medical concerns. The questionnaire shall include health status as known occupational exposures since the previous examination. The medical history questionnaire will be supplied by the contract Medical Contractor.

VI.B.2. Information on the questionnaire and concerns shall be reviewed with each member by the contract medical provider.

#### VI.C. The Physical Exam

VI.C.1. All components listed in Appendix A shall be included in the annual medical evaluation for members. See Appendix A.

VI.C.2. The medical evaluations will be conducted at the contract medical provider's facility or other predetermined location.

VI.C.3. The estimated time to complete the medical exam and subsequent fitness assessment is approximately 3-4 hours.

VI.C.4. Personnel will have the opportunity to complete a satisfaction survey after the physical exam.

#### VI.D. Scheduling of Appointments and Completing Exams

VI.D.1. Typically, an entire company will be scheduled at the same time.

VI.D.2. Individual volunteer members will be scheduled during evenings or weekends. They may elect to attend a daytime appointment.

VI.D.3. If a member cannot attend at their scheduled time, the scheduling coordinator must be notified. Failure to do this may result in disciplinary action.

VI.D.4. Rescheduling will be done as soon as practical.

VI.D.5. When possible the Health and Safety Division will schedule blood draws and medical examinations during a career member's regularly scheduled shift.

#### VI.E. Review of Test Results

- VI.E.1. Recommendations for follow-up action by the member may include referral to a specialist, exercise physiologist, and/or further testing by the member's personal physician.
- VI.E.2. The costs of referred specialists and/or further testing not covered by the individual's health care insurance will be evaluated for payment under risk management, group health benefits or workers compensation benefits, depending upon the issues involved.
- VI.E.3. The member MAY choose his/her personal physician for follow up. The physician may be the contract medical provider.
- VI.E.4. If work related, Risk Management may be responsible for the bill.
- VI.E.5. The physician may prescribe a personalized exercise plan based upon the physical exam. These activities are designed to maintain or improve the member's health status for the next exam.
- VI.E.6. The physician may suggest the member consult with the fire department's exercise kinesiologist.
- VI.E.7. The member may choose not to follow these recommendations and **NO** disciplinary action will be initiated.
- VI.E.8. Medical/fitness issues are monitored in accordance with the WFI Medical Process Flow Chart, Appendix E.
- VI.E.9. The contract medical provider will provide written results to the member about the medical exam within four weeks of the physical exam.

## VII. FITNESS ASSESSMENT

### VII.A. Aerobic Capacity

The sub-maximal volume oxygen uptake, (VO<sub>2</sub>), treadmill evaluation shall use the Gerkin Treadmill Protocol to measure aerobic capacity. The treadmill shall be a Life Fitness commercial treadmill or equivalent capable of obtaining a 15% grade and 10 mph. The fire department must verify that the treadmill is equivalent to the Life Fitness commercial treadmill and is compatible with a Polar Heart Rate Monitor which shall be used for heart rate measurements and a stopwatch used for timing.

### VII.B. Muscular Strength

- VII.B.1. Hand Grip Dynamometer – Hand grip strength evaluations shall use the protocol as defined by the IAFF Wellness-Fitness Initiative. The hand grip dynamometer shall be a Jamar Hydraulic Hand dynamometer.
- VII.B.2. Arm Dynamometer – Arm strength evaluations shall use the protocol as defined by the IAFF Wellness-Fitness Initiative. The arm dynamometer shall be the Jackson Strength Evaluation System or a commercial dynamometer system that is digital, and incorporates a load cell, a control unit, an adjustable chain, handle bar, and test platform. The fire department must verify that the dynamometer is equivalent to the Jackson Strength Evaluation System. A straight-grip handlebar is required.

VII.B.3. Leg Dynamometer – Leg strength evaluations shall use the protocol as defined by the IAFF Wellness-Fitness Initiative. The leg dynamometer shall be the Jackson Strength Evaluation System or a commercial dynamometer system that is digital, and incorporates a load cell, a control unit, an adjustable chain, handle bar, and test platform. The fire department must verify that the dynamometer is equivalent to the Jackson Strength Evaluation System. A V-grip handlebar, (chinning triangle), is required.

VII.C. Muscular Endurance

Push-up – Push-up muscle endurance evaluations shall use the protocol for push-ups as defined by IAFF Wellness-Fitness Initiative Protocol. Equipment used for this evaluation include a five inch prop (i.e. cup, sponge), a metronome and a stop watch.

VII.D. Flexibility

Sit and Reach – Sit and reach flexibility evaluations shall use the sit and reach protocol as defined by IAFF Wellness-Fitness Initiative. Equipment used for this evaluation shall be a Novel Acuflex I or equivalent trunk flexibility tester that compensates for variable arm and leg lengths.

## VIII. APPENDIX A



## MEDICAL EVALUATION

## DOCUMENTATION

## OCCUPATIONAL MEDICAL EVALUATION OF FIREFIGHTERS

Outlined below are components of an annual Occupational Medical Evaluation for Firefighters as recommended by the National Fire Protection Association Standard 1582, *Comprehensive Occupational Medical Program for Fire Departments, 2003 Edition*.

**Medical History**

- A medical history questionnaire should establish baseline information from which to compare future medical concerns. It shall provide follow-up information which includes changes in health status and known occupational exposures since the last evaluation.

**Physical Examination**

- Vital signs
- Head, eyes, nose and throat (HEENT)
- Neck
- Cardiovascular
- Pulmonary
- Breast
- Gastrointestinal (includes rectal exam for mass, occult blood)
- Genitourinary (testicular exam, rectal exam for prostate mass)
- Hernia
- Lymph nodes
- Neurological
- Musculoskeletal
- Skin (includes screening for cancers)
- Vision

**Blood Tests**

- CBC with differential, RBC indices and morphology, and platelet count
- Electrolytes (Na, K, CL, HCO<sub>3</sub>, or CO<sub>2</sub>)
- Renal function (BUN, creatinine)
- Glucose
- Liver function tests (ALT, AST, direct and indirect bilirubin, alkaline phosphatase)
- Total cholesterol, HDL, LDL, clinically useful lipid ratios (e.g. percent LDL), and triglycerides
- Prostate specific Antigen (PSA) after age 40 for positive family history, African American, or if otherwise clinically indicated; after age 50 for other male members

**Urine Laboratory Tests**

- Dipstick analysis for glucose, ketones, leukocyte esterase, protein, blood, and bilirubin.
- Microscopic analysis for RBC, WBC, casts and crystals if indicated by results of dipstick analysis.
- Analysis for occupational chemical exposure if indicated.

**Audiology** - Hearing thresholds shall be assessed in each ear at each of the following frequencies.

- 500 Hz R  L  1000 Hz R  L
- 2000 Hz R  L  3000 Hz R  L
- 4000 Hz R  L  6000 Hz R  L
- 8000 Hz R  L

- The medical evaluator shall compare audiogram results obtained during yearly evaluation with baseline and subsequent test results.

**Spirometry**

- Pulmonary function testing (spirometry) shall be conducted to measure the member's forced vital capacity (FVC), forced expiratory volume in 1 second (FEV<sub>1</sub>), and the FEV<sub>1</sub>/FVC ratio.
- Medical evaluator shall compare spirometry results obtained during yearly evaluations with baseline and subsequent test results.
- Results shall be corrected according to the American Thoracic Society (ATS) guidelines and normative equations found in Knutson et al (1983) and the American College of Occupational and Environmental Medicine (2000).

**Chest Radiographs**

- Chest X-rays shall include an initial baseline and shall be repeated every 5 years or as medically indicated.
- The medical evaluator shall compare any chest radiographs with baseline and subsequent radiographs.

**Electrocardiograms (EKG)**

- A resting EKG shall be performed as part of the baseline medical evaluation and shall be obtained annually thereafter.
- The qualified medical evaluator shall compare EKG's obtained during yearly evaluations with baseline and subsequent EKG's.
- No firm guidelines for stress electrocardiography in asymptomatic individuals have been developed. In those with two or more risk factors for CAD (hypercholesterolemia, hypertension, smoking, diabetes mellitus, or family history of premature CAD), there is probable justification for performing the testing.

**Immunizations and Infectious Disease Screening**

- The following infectious disease immunizations or infectious disease screening shall be provided as indicated:
  - Tetanus/diphtheria vaccine (booster every 10 years).
  - Measles, mumps, rubella vaccine (MMR).
  - Varicella vaccine. Vaccine shall be offered to all non-immune personnel.

**Heavy Metal Evaluation**

- Baseline testing for heavy metals shall be required when indicated.
- Evaluations shall be performed following known exposures, for recurrent exposures, or where required under federal, state, or local regulations.

**Screening Colonoscopy Services**

- Screening colonoscopy services shall be provided to all members above the age of 50 or earlier if clinically indicated.

*The following exams are recommended by NFPA 1582 but are not performed by Concentra. Personnel will be referred to their primary care physician*

**Mammography**

- Mammography shall be performed annually on each female member over the age of 40.
- A qualified radiologist shall compare mammograms to prior mammograms. The physician shall compare mammography reports to prior reports.

**Genitourinary**

- Genitourinary (includes pap smear)



**IX. APPENDIX B**

Pre-Assessment Questionnaire

Last Name \_\_\_\_\_ First Name \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ DOB \_\_\_\_\_ Age \_\_\_\_\_ Gender \_\_\_\_\_

Please read the following questions carefully and answer each one honestly, before starting to exercise with a Peer Fitness Trainer. All information will be kept confidential.

YES NO

- \_\_\_ \_\_\_ 1. Are you a male over 45 years of age?
- \_\_\_ \_\_\_ 2. Are you a female over 55 years of age?
- \_\_\_ \_\_\_ 3. Has anyone in your immediate family (parents/brothers/sisters) had a heart attack, stroke, or cardiovascular disease before the age of 55? If yes who? \_\_\_\_\_
- \_\_\_ \_\_\_ 4. Are you currently using tobacco products? \_\_\_ Cigarettes \_\_\_ Cigars \_\_\_ Chewing tobacco? If yes, how long have you been using tobacco? \_\_\_ How much per day? \_\_\_
- \_\_\_ \_\_\_ 5. Have you quit using tobacco products? \_\_\_ If yes how long ago? \_\_\_
- \_\_\_ \_\_\_ 6. Have you ever been told that you had high blood lipids or high cholesterol readings?
- \_\_\_ \_\_\_ 7. Are you a diabetic?
- \_\_\_ \_\_\_ 8. Are you currently exercising less than 1 hour per week? \_\_\_\_\_  
If you answer no, please list you activities \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- \_\_\_ \_\_\_ 9. Has a physician ever told you or are you aware that you have high blood pressure?
- \_\_\_ \_\_\_ 10. Do you have a history of heart problems or ever been told you have a heart murmur?
- \_\_\_ \_\_\_ 11. Do you feel pain or discomfort in your chest at rest or with exercise?
- \_\_\_ \_\_\_ 12. Do you ever lose consciousness or have you ever lost control of your balance due to dizziness?
- \_\_\_ \_\_\_ 13. Do you ever experience unusual fatigue or shortness of breath with normal daily exercise?
- \_\_\_ \_\_\_ 14. Do you have any type of pulmonary or breathing problems such as asthma, emphysema or COPD?
- \_\_\_ \_\_\_ 15. Have you ever had a stroke?
- \_\_\_ \_\_\_ 16. Do you have epilepsy or have you ever had a seizure?
- \_\_\_ \_\_\_ 17. Is there a family history of diabetes, high blood pressure or cancer?
- \_\_\_ \_\_\_ 18. Are you currently pregnant?

(Appendix B continued)

- \_\_\_ \_\_\_ 19. Are you currently being treated for a bone or joint problem that restricts you from engaging in physical activity?

- \_\_\_ \_\_\_ 20. Your last physical \_\_\_\_\_(date).
- \_\_\_ \_\_\_ 21. Do you ever feel your heart race uncontrollably or “skip” a beat?
- \_\_\_ \_\_\_ 22. Do you have any unusual shortness of breath at rest or with mild exertion?
- \_\_\_ \_\_\_ 23. Are you currently taking any dietary supplements or medications? If yes, please list the name of the medication/supplement and the reason for taking it: \_\_\_\_\_  
\_\_\_\_\_

Are you an active firefighter? \_\_\_\_\_  
When was your last NFPA compliant physical? \_\_\_\_\_

Emergency contact name \_\_\_\_\_  
Phone number \_\_\_\_\_  
Relationship \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

PFT Signature \_\_\_\_\_ Date \_\_\_\_\_



## X. Appendix C

### Fitness Protocol Worksheet

Name: \_\_\_\_\_ Date \_\_\_\_\_ Time: \_\_\_\_\_

Trainer: \_\_\_\_\_

Last Medical Exam Date: \_\_\_\_\_

Age: \_\_\_\_\_

Weight: \_\_\_\_\_ kilograms  
(1 lb = .45 kg)

Height: \_\_\_\_\_ meters  
(1 inch = 0.0254 m)

Body Mass Index (BMI): \_\_\_\_\_ kg/m<sup>3</sup>  
*BMI (kg/m<sup>3</sup>) = body weight (kg) / height (m)*

Resting Heart Rate: \_\_\_\_\_  
*(If greater than 110 bpm, provide 5-min.rest; if after rest HR is greater than 110 bpm postpone evaluation.)*

Resting Blood Pressure: \_\_\_\_\_  
*(If greater than 160/100, provide 5-min. rest; if after rest BP is greater than 160/100 postpone evaluation.)*

**Body Composition:** *(trainer can elect to do 3 or 7 site skin fold, use \*for males & \*\* for females)*

#### Skin fold Measurements:

Men

Women

Average of  
3 Trials

Trial 1 Trial 2 Trial 3 Trial 1 Trial 2 Trial 3

Chest\*  
Midaxilla  
Triceps\*\*  
Subscapula  
Abdomen\*  
Suprailium\*\*  
Thigh \* & \*\*

Sum of Totals: \_\_\_\_\_

Total Body Fat %: \_\_\_\_\_ *(use 3 or 7 site conversion chart located in fitness assessment binder)*

**Strength Evaluation:**

**A. Grip Strength**

Dominant Hand: \_\_\_\_ Left / \_\_\_\_

Right

Left

Right

Trial 1

Trial 2

Trial 3

Highest Grip Strength Score: \_\_\_\_\_ kg

Evaluation terminated, give reason (s): \_\_\_\_\_

**B. Leg Strength (V-Grip)**

Trial 1: \_\_\_\_\_ Trial 2: \_\_\_\_\_ Trial 3: \_\_\_\_\_

Highest Leg Strength Score: \_\_\_\_\_ kg

Evaluation terminated, give reason(s): \_\_\_\_\_

**C. Arm Strength (Curl Bar)**

Trial 1: \_\_\_\_\_ Trial 2: \_\_\_\_\_ Trial 3: \_\_\_\_\_

Highest Arm Strength Score: \_\_\_\_\_ kg

Evaluation terminated, give reason(s): \_\_\_\_\_

**Endurance Evaluation:**

**A. Push – Ups**

Number of successfully completed push-ups: \_\_\_\_\_

Evaluation terminated, give reason(s): \_\_\_\_\_

**B. Curl – Ups**

Number of successfully completed push-ups: \_\_\_\_\_

Evaluation terminated, give reason(s): \_\_\_\_\_

**Flexibility Evaluation****Sit and Reach:**

Trial 1: \_\_\_\_\_ inches

Trial 2: \_\_\_\_\_ inches

Trial 3: \_\_\_\_\_ inches

Furthest distance: \_\_\_\_\_ inches

Evaluation terminated, give reason(s):  
\_\_\_\_\_**Aerobic Capacity Evaluation – Gerkin Protocol****Gerkin Protocol Treadmill Test:**

Warm-Up: 3.0 mph, 0 % grade      3 minute warm-up

Stage 1: 4.5 mph, 2 % grade      Heart Rate: \_\_\_\_\_

Stage 2: 4.5 mph, 2 % grade      Heart Rate: \_\_\_\_\_

Stage 3: 5.0 mph, 2 % grade      Heart Rate: \_\_\_\_\_

Stage 4: 5.0 mph, 4 % grade      Heart Rate: \_\_\_\_\_

Stage 5: 5.5 mph, 4 % grade      Heart Rate: \_\_\_\_\_

Stage 6: 5.5 mph, 6 % grade      Heart Rate: \_\_\_\_\_

Stage 7: 6.0 mph, 6 % grade      Heart Rate: \_\_\_\_\_

Stage 8: 6.0 mph, 8 % grade      Heart Rate: \_\_\_\_\_

Stage 9: 6.5 mph, 8 % grade      Heart Rate: \_\_\_\_\_

Stage 10: 6.5 mph, 10 % grade      Heart Rate: \_\_\_\_\_

Stage 11: 7.0 mph, 10 % grade      Heart Rate: \_\_\_\_\_

Stage Completed: \_\_\_\_\_

HR after 1 min cool-down: \_\_\_\_\_

VO2 max: \_\_\_\_\_ ml/kg/min (use conversion chart on last wksht page)

Time evaluation terminated: \_\_\_\_\_

Reason(s) for termination: \_\_\_\_\_

<b>Stage</b>	<b>Time</b>	<b>Converted VO2 max</b>
1	1:00	31.15
2.1	1:15	32.55
2.2	1:30	33.6
2.3	1:45	34.65
2.4	2:00	35.35
3.1	2:15	37.45
3.2	2:30	39.55
3.3	2:45	41.30
3.4	3:00	43.4
4.1	3:15	44.1
4.2	3:30	45.15
4.3	3:45	46.2
4.4	4:00	46.5
5.1	4:15	48.6
5.2	4:30	50
5.3	4:45	51.4
5.4	5:00	52.8
6.1	5:15	53.9
6.2	5:30	54.9
6.3	5:45	56
6.4	6:00	57
7.1	6:15	57.7
7.2	6:30	58.8
7.3	6:45	60.2
7.4	7:00	61.2
8.1	7:15	62.3
8.2	7:30	63.3
8.3	7:45	64
8.4	8:00	65
9.1	8:15	66.5
9.2	8:30	68.2
9.3	8:45	69
9.4	9:00	70.7
10.1	9:15	72.1
10.2	9:30	73.1
10.3	9:45	73.8
10.4	10:00	74.9
11.1	10:15	76.3

11.2	10:30	77.7
11.3	10:45	79.1
11.4	11:00	80

**Gerkin  
Protocol  
Conversion Table**

## XI. APPENDIX D: FITNESS EQUIPMENT

### I. PREVENTATIVE MAINTENANCE

- I.A. Safety of the exercise equipment will be maintained through regular examination for damage or wear.
- I.B. Fitness Program Coordinator will develop a maintenance log book. All cleaning, repairs, and preventative checks will be logged on the log sheets.
- I.C. Cleaning solution (1 drop of antibacterial hand soap mixed with warm water in a spray bottle) will be ordered and supplied by the supplies section of Logistics.
- I.D. The Life Fitness Treadmill will be cleaned on a daily basis to keep it operating at peak performance. Inspect and vacuum the area directly surrounding the equipment and under units regularly. The base of the treadmill lifts up easily for cleaning purposes.
- I.E. The elliptical machines will require daily cleaning of all exterior parts, including the console. The fitness program coordinator will designate an individual to perform a more detailed maintenance check, per the manufacturer's suggestions.
- I.F. Cable-motion, strength training equipment will be wiped down with a non-abrasive cleaner and a soft cloth each day. Remove and clean any debris accumulating on the exterior and surrounding areas of the equipment.
- I.G. Plate-loaded strength equipment will be wiped down with a non-abrasive cleaner and a soft cloth each day. The fitness program coordinator will implement a detailed maintenance check on a quarterly basis.
- I.H. Free weight strength equipment will be wiped down with a non-abrasive cleaner and a soft cloth each day.
- I.I. Stability balls and exercise mats will be wiped down with a non-abrasive cleaner and a soft cloth each day.

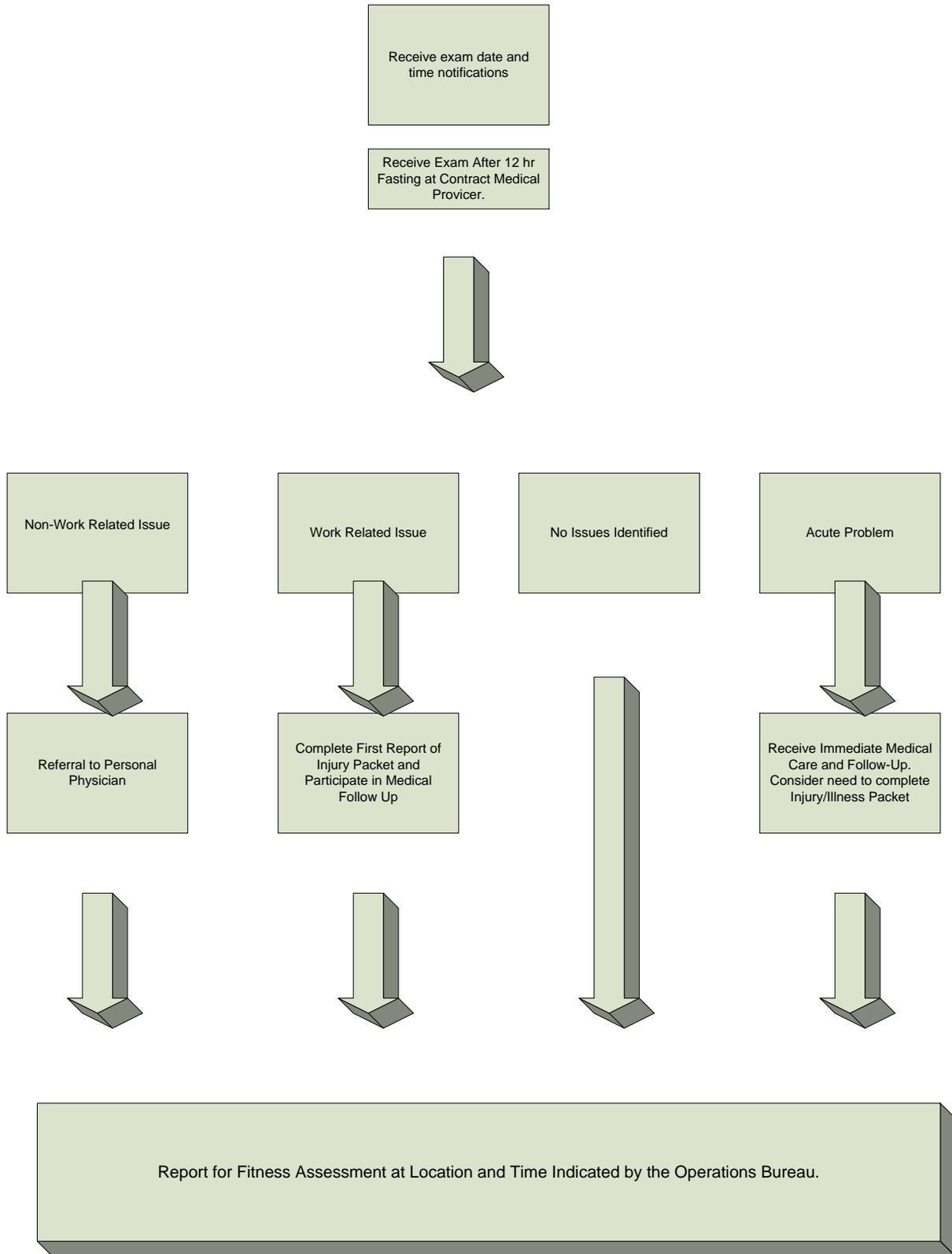
### II. BROKEN/MALFUNCTIONING EQUIPMENT

- II.A. All malfunctioning equipment is to be reported to the Fitness Program Coordinator in the Health & Safety Division via email at [FD009809@aacounty.org](mailto:FD009809@aacounty.org). The coordinator will follow the necessary steps to have the equipment repaired via the manufacturer's warranty or the designated equipment maintenance provider.
- II.B. Broken equipment will be marked and labeled with an "OUT OF ORDER" sign. These signs will be conveniently provided for each station to use and re-use.
- II.C. Equipment may not be removed, disassembled, or replaced without contacting the Fitness Program Coordinator. Approval from the Health & Safety Office must be given before the exercise equipment can be manipulated in any way.
- II.D. Under no circumstances, can malfunctioning or functioning equipment be moved to any other location besides its original, designated area.

### III. NEW EQUIPMENT

- III.A. Equipment purchases made outside of the fitness/wellness initiative grant must be approved by the Division Chief of Health & Safety.
- III.B. If a volunteer company wishes to purchase exercise equipment for a volunteer owned facility; they will need approval from the Division Chief of the Health & Safety Office in order for career personnel to be able to utilize the equipment.
- III.C. Career fire department personnel do not have permission to use exercise equipment in fire department facilities; other than equipment that has been approved by the Health & Safety Division.
- III.D. Donated exercise equipment must also be pre-approved by the Health & Safety Division prior to donation, delivery, and acceptance.

**XII.** Appendix E: Medical Process Flowchart



APPENDIX H

Map of Anne Arundel County

