Developing an Emergency Medical Technician Evaluation Procedure

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Certification Statement

I hereby certify that this submission 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.



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Abstract

Rapid advancement in treatment modalities and medical equipment have contributed to the increased scope of practice placed on prehospital medical providers. Fire service agencies have been challenged with ensuring their medical providers meet benchmarks established for skill and knowledge competency. The problem was that Fairmount Fire Protection District (FFPD) has not implemented regular and recurrent assessment of Emergency Medical Technician (EMT) skills and knowledge resulting in unknown levels of performance. The purpose of this applied research project was to create an internal FFPD procedure for recurrent assessment of EMT skills and knowledge. Action research methodology was used to develop an internal procedure by answering the following four questions: Should an Emergency Medical Services (EMS) agency conduct regular, recurring, formal assessment of its EMTs? What skills and knowledge should be evaluated in an EMT assessment procedure? How frequently should an EMT assessment occur? What are the financial costs and time required to administer a regularly recurring EMT assessment program? A review of literature and personal interviews identified information that indicated annual evaluation of EMT competency was an appropriate mechanism and cycle for assessments. Research was conducted through the use of a survey administered to FFPD EMTs, an EMS educator questionnaire, and a questionnaire targeted at EMS supervisors. This resulted in the creation of an annual EMT skills and knowledge assessment procedure for FFPD (Appendix G). It was recommended that the newly implemented EMT assessment procedure be monitored for effectiveness and that further research focus on the correlation between frequent demonstration of skills competency and an agency's exposure to liability.

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Developing an Emergency Medical Technician Evaluation Procedure

Prehospital emergency medicine has evolved in many areas. The body of medical knowledge has expanded, Emergency Medical Service (EMS) equipment has seen innovations improve field assessment and patient care, and treatment modalities have been refined. Fire service agencies that provide EMS must ensure providers are skilled, knowledgeable and perform at a level paced with advancements in medical care. Without a regular recurrent assessment of providers, an organization cannot effectively evaluate whether providers meet expectations established by the agency and agency medical director.

Many fire service agencies deliver EMS as one of the all-hazard responses provided to their community. These same agencies must contend with changes in both medical knowledge and the equipment used on EMS incidents. One challenge associated with these advancements has been ensuring agency EMS providers can consistently perform at established performance levels. Agencies responsible for the delivery of prehospital medical care can only confirm EMS skill and knowledge through the use of a performance measurement tool. Frequent changes to medical protocol and treatment regimens have amplified the need to conduct regular recurrent assessments of medical providers.

The problem is that the Fairmount Fire Protection District (FFPD) has not implemented regular and recurrent assessment of Emergency Medical Technician (EMT) skills and knowledge resulting in unknown levels of performance. The purpose of this applied research project (ARP) is to create an internal FFPD procedure for recurrent assessment of EMT skills and knowledge. Action research methodology was used to develop an internal procedure by answering the following research questions: (a) Should an EMS agency conduct regular, recurring, formal assessment of its EMTs? (b) What skills and knowledge should be evaluated in an EMT

assessment procedure? (c) How frequently should an EMT assessment occur? (d) What are the financial costs and time required to administer a regularly recurring EMT assessment program?

Background and Significance

FFPD is located at the foothills of the Colorado Rocky Mountains, just west of the Denver metropolitan area. The fire district serves portions of the cities of Golden and Arvada, along with a portion of unincorporated Jefferson County. FFPD is comprised of 25 square miles consisting primarily of single-family homes, commercial buildings, light industrial, and a large industrial complex.

The landscape is a mix of suburban, wildland urban interface, and open space. The district has a full-time resident population of approximately 19,000 and during regular business hours this number increases to approximately 35,000 (American Fact Finder, 2010). FFPD is home to MillerCoors, the largest single-site brewery in the world (MillerCoors, 2017, screen). Several Fortune 500 companies, such International Paper and Ball Metal, operate facilities within FFPD's borders (Fortune, 2016). The district has hosted portions of the U.S. Pro Cycle Challenge and outdoor recreation seekers frequent the area for its quick accessibility to hiking, mountain biking, and fly-fishing.

FFPD is a combination of volunteer and career members providing all-hazard response. These hazards include structural fire response, EMS, hazardous materials response, vehicle accidents, technical rescue, and wildland firefighting incidents. In 2016, the district responded to 707 incidents (Emergency Reporting). Medical emergencies comprised 64% of the annual call volume during this time frame (Emergency Reporting).

The District is organized into four divisions comprised of operations, life safety, support services, and administration. There are 76 total personnel in the organization. Of this, 73

members are uniformed personnel and three are civilians. Uniformed personnel can be further subdivided into 27 paid firefighters and 46 volunteer firefighters.

Service delivery is provided to the community utilizing three shifts, working a 48-hour shift schedule, responding from three stations. Station 31 houses the on-duty Battalion Chief, one privately contracted advanced life support medic unit, administrative staff, and reserve equipment. Station 32 houses a Type-1 Engine, Type-2 Tender, Type-6 Brush Truck, an all-terrain vehicle and a Type-3 Engine used primarily for wildland deployments. Station 33 is home to a Type-1 Engine and Type-6 Brush Truck. Both Station 32 and Station 33 maintain a minimum staffing of three personnel 24-hours a day, 365 days a year.

FFPD is surrounded by five fire service agencies ranging from large career fire districts, small combination fire districts, to a small volunteer fire district. Automatic aid, enhanced mutual aid, or mutual aid agreements are in place with these neighboring agencies. FFPD is dispatched through West Metro Dispatch, a regional fire service 911-dispatch center. FFPD is a participating member of regional resources such as the Adams-Jefferson County Hazardous Materials Team and the West Area Strike Team.

Since the late 1960's, FFPD has contracted ambulance services with private companies (J. Hager, personal communication, February 2, 2017). Currently, the district contracts advanced life support transportation service through American Medical Response, a private ambulance company. This company provides an ambulance at Station 31, staffed with one EMT and one paramedic. When the need arises for additional ambulances, this private company is typically the provider for subsequent advanced life support medic units responding within the boundaries of FFPD. On rare occasions, such as when the private ambulance company's resources are out of

position or assigned to other incidents, mutual aid requests will be made to neighboring fire service agencies for advanced life support medic units.

From FFPD's establishment in 1962, until 1986, cardiopulmonary resuscitation (CPR) was the minimum medical credential required of district members (J. Hager, personal communication, February 2, 2017). Chief Hager explained that in 1986, Fairmount hosted its first emergency medical responder course for district members. Hager noted that during that same year, a few individual members began completing EMT school on their own. Chief Hager explained that the district first partnered with a physician for medical direction in 1987 and the minimum medical certification requirement became emergency medical responder until 2016 (personal communication, February 2, 2017). While most paid firefighters had an EMT certificate before being hired by FFPD, possession of EMT certification was not included in the job description of paid firefighter positions until 2016. The minimum medical certification required of volunteer firefighters remains emergency medical responder.

Colorado EMTs are required to work under the medical direction of a physician (Emergency Medical Services, 2006/2016). The district's medical direction is provided by a physician advisor group affiliated with St. Anthony's Hospital in Lakewood, Colorado. This group of emergency physicians determines the medical protocols and standing orders for prehospital medical providers working under their oversight.

FFPD's medical direction group mandates that EMTs working under their oversight follow medical protocols developed by both the Denver Metropolitan EMS Medical Directors and an addendum of protocols specific to agencies affiliated with St. Anthony's Hospital. St. Anthony's Hospital agency specific protocols allow for advanced EMT practices otherwise not approved in the *Denver Metro Protocols*. The Denver Metropolitan EMS Medical Directors group meets

quarterly to review medical protocols; updates to these protocols are approved and distributed for use every six months.

Two additional medical credentials maintained by FFPD EMTs, are intravenous (IV) therapy and CPR for the healthcare provider. CPR certification lasts for two years before renewal is required and completion of IV training has no Colorado state requirement for further continuing education or clinical skills verification.

The challenge for Fairmount EMS program administrators has been ensuring competency of EMTs in a Colorado recertification system that only requires demonstration of psychomotor skills every three years (Emergency Medical Services, 2006/2016). For example, Colorado EMT recertification requires 36 hours of continuing education be accomplished in a three-year certification period (Emergency Medical Services, 2006/2016). Similarly, CPR certification has the requirement to be renewed every two years ("Revising protocols," 2010). An individual could accomplish all continuing education requirements during the last month of a certification cycle and have met the Colorado recertification requirements. When this scenario is combined with a lower call volume EMS system, biannual protocol changes, and frequent addition of new members with little experience as EMTs, all contribute to an environment ripe for skill and knowledge deficits. Inconsistencies regarding EMT performance have been identified and noted during monthly EMS training, on medical calls, and during completion of the quality assurance and quality improvement processes associated with the review of patient care reports.

FFPD has never implemented regular, recurrent, evaluations for the purpose of confirming each EMTs ability to meet agency-defined expectations. When the idea of EMT skill evaluations have been discussed with district members, feedback illustrates a common message, “Why do we need to do that? We have never done it before.” Without the frequent assessment

of EMTs, there is no mechanism to ensure expectations are being met consistently. In fact, not evaluating EMTs on a consistent basis can be interpreted as conflicting with FFPD's mission statement, "To provide the highest level of professional services while preserving life, property and the environment by being proactive, progressive and responsive to our communities" (n.d., screen). Failure to ensure provider proficiency is neither proactive nor does it reinforce maintaining a high level of professionalism. Implementation of an EMT evaluation process has demonstrated the organization's commitment towards achievement of the FFPD mission statement.

The research conducted in this ARP related to several content areas addressed in the Executive Development course. The two content areas addressed were the facilitation of scholarly research and managing challenges associated with organizational change (FEMA, 2016).

Completion of this ARP supported two of the United States Fire Administration goals (a) "enhance the fire and emergency services' capability for response to and recovery from all hazards" and (b) "advance the professional development of fire service personnel and of other people engaged in fire prevention and control activities" (United States Fire Administration, 2014-2018, p. 9). Both goals were achieved by implementation of an internal FFPD procedure that raised the district's professional standard for EMTs and improved service delivered by providers.

Literature Review

The process of developing an EMT evaluation procedure at FFPD began with an understanding of the recertification requirements. Colorado requires 36 hours of continuing education over a three-year period, valid CPR certification and demonstration of EMS skills

(Emergency Medical Services, 2006/2016). A medical director, medical director designee, or an approved Colorado EMS education group, all have authority for confirmation of continuing education completion, verification of a valid CPR card and facilitation of skills performance assessment (Emergency Medical Services, 2006/2016).

Current National Registry of Emergency Medical Technicians (NREMT) standards for EMT recertification require 72 hours of continuing education be completed during the two-year certification cycle, possession of a valid CPR card, and skills assessment (National Registry of Emergency Medical Technicians, 2016). NREMT further stated that an approved EMS training officer is responsible for a candidate's psychomotor skills evaluation.

Many national organizations have provided guidelines for training and evaluation requirements related to EMTs. One such organization, the National Fire Protection Agency (NFPA), developed *NFPA 450* as a standard for EMS. *NFPA 450* states that medical oversight has responsibility for "providing direction and authorization for educating and testing to the level of proficiency approved for different certification levels within the EMS system" (National Fire Protection Agency, 2017, p. 450-18). However, specifics regarding how an EMS organization conducts testing are not defined in this document.

The St. Anthony's Hospital manual for prehospital educators provides guidance regarding optional assessments of EMS skills. This manual details the procedure for facilitation of the following three optional practical assessment stations: trauma patient assessment, medical patient assessment, and defibrillator skill station (*Coordinator manual*, n.d.). The hospital guidance regarding skills evaluations is optional and the frequency by which testing should occur is not addressed.

Effective testing and evaluative procedures are considered one component of a successful training program. The International Fire Service Training Association describes the “four-step development model” as a tool to assist in creating a successful fire service training program (International Fire Service Training Association, 2012). The last step in this model is evaluation of the program. The International Fire Service Training Association has identified assessment of skills and knowledge to be a crucial step in determining the effectiveness of a training program (International Fire Service Training Association, 2012).

In *The Fire Chief’s Handbook*, Richard Marinucci (2003) explained the need for an organization to conduct routine testing of their personnel for confirmation of competency in a given skill set. With frequent legal changes, evolving types of service delivery, and high service expectations from those served, Marinucci described the evaluative process as being an important tool for an organization's leadership to gauge performance (Marinucci, 2003). To communicate clear expectations throughout an organization, Marinucci stated that “regulations, special orders, policies, and procedures" were the formal tools used to accomplish this goal (Marinucci, 2003, p. 938).

Escott (2015) discussed the difference between certification and credentialing in his article, *Staying proficient in clinical decision-making skills*. Physicians gain approval to practice medicine in a given state, by holding valid licensure or certification. Escott (2015), explained that for physicians to receive approval to work in a hospital and obtain privileges for patient treatment, the physician must demonstrate competency. Upon successful completion of an entity’s evaluation process, the physician becomes credentialed for one year at the facility in question (Escott, 2015, para. 2).

The first research question asked in this ARP is, “Should an EMS agency conduct regular, recurring, formal assessment of its EMTs?” Dave Sanko, a prehospital educator for south Denver metropolitan agencies, believed EMS agencies should facilitate regular performance testing (personal communication, January 25, 2017). Sanko holds the opinion that state and national EMT certification requirements are the bare minimum and more frequent evaluations were required to ensure competency (D. Sanko, personal communication, January 25, 2017).

In 2008, all paramedics working at the District of Columbia Fire Department were required by the agency’s physician advisor to participate in the testing of advanced life support job performance requirements. The physician advisor, Dr. Williams, stated, “I’ve got to make sure that we don’t let somebody out there that isn’t functioning at that level” ("D.C. paramedics," 2008, para. 5).

The concept of conducting routine testing to confirm competency of an organization or individual is not isolated to emergency services. Laboratories responsible for water quality must demonstrate skills and knowledge competency to achieve and maintain accreditation (Guo, Xiang, & Song, 2014, p. 2201). Guo et al. (2014) explained that it was important to confirm the technical competence of a laboratory responsible for water quality monitoring; the implications of not achieving industry minimum standards during water sampling were risk to the health of the public, high degree of financial liability, and loss of public confidence.

Robert Burton’s article in Fire Engineering magazine confirms the need to conduct evaluations. When conducting EMS scenarios, Burton was able to identify the strengths and weaknesses of each provider. Burton (2014) observed that simulated scenarios brought to light, weak performers who typically could hide within the overall team performance. Burton

concluded that upon completion of an evaluation, his next step would be to implement corrective training to improve identified weaknesses (Burton, 2014).

The second research question of this ARP was, “What skills and knowledge should be evaluated in an EMT assessment program?” Several sources of information were found during an online search of this topic and through interviews with prehospital educators from the Denver region.

Acadian Ambulance is a provider of EMS in several southern states. In 2012, this organization made the decision to conduct evaluations of its personnel on an annual basis ("Acadian ambulance," 2012). The testing focused on the provider’s core lifesaving skill sets and included scenarios that evaluated a participant’s ability to correctly operate EMS equipment ("Acadian ambulance," 2012). This evaluation process provided Acadian Ambulance with an opportunity to both assess personnel and demonstrate the agency’s commitment to ensuring highly competent providers ("Acadian ambulance," 2012).

As medical director for the District of Columbia Fire Department, Dr. Williams implemented an Advance Life Support (ALS) skills and knowledge evaluation for personnel under his supervision. The assessment process utilized a written exam to gauge provider knowledge and psychomotor skill stations allowed for evaluation of hands-on skills ("D.C. paramedics," 2008). Minor skill and knowledge infractions were corrected through training, however, significant deficits in job performance resulted in removal of the provider from an ALS delivery role ("D.C. paramedics," 2008).

An interview with Centura prehospital educator, Mike Grill, identified some areas he felt were important to assess on a regular basis. These areas included Colorado and NREMT required psychomotor skill stations, knowledge of local medical protocols, cardiac arrest

management, and ventilation management (M. Grill, personal communication, January 25, 2017). Additionally, Grill stated that medical director approved scope of practice waivers should also be frequently assessed. Two examples Grill provided regarding waiver specific procedures were prehospital ultrasound and sepsis alert criteria. (M. Grill, personal communication, January 25, 2017).

Amar Patel's (2016) article on individual and team performance evaluations addressed the benefit of a scenario-based assessment, versus an isolated skill station. Single skill performance evaluations have a place for testing procedural knowledge, however, Patel felt that scenario-based team testing was more realistic and required participants to manage the whole medical incident (Patel, 2016).

The third research question asked in this ARP was, "How frequently should an EMT evaluation occur?" The literature review provided insight to this question from sources ranging from the field of military aviation to EMS.

Air Force Major Slinkard, presented the concept of "volume-based training" as compared to "frequency-based training" (Slinkard, 2012, para. 1). Slinkard (2012), stated that frequency-based training focused efforts on skill evaluation occurring on a regular and recurrent cycle. Slinkard (2012), believed the benefit of frequency-based training is that skill proficiency must be demonstrated regularly during a given period of time, whereas volume-based training only required a given number of training hours occur within a certain time frame. Slinkard (2012), explained that one downside to volume-based training was that it allowed an individual to squeeze all the training requirements into a small portion of a certification cycle.

Military aviator, Lieutenant Commander Smith, reinforced the idea of frequency-based training in his article for *Approach* magazine. As a naval aviator, Smith (2012) observed that his

fellow pilots achieved flight-time requirements in two very different fashions. Smith noted that "100 hours can be obtained several different ways: 100 hours from 50 sorties is a lot different than 100 hours from 10 sorties" (Smith, 2012, p. 5).

A challenge with volume-based training can be observed with CPR certification. CPR certification lasts for two years, however, changes to CPR guidelines do not coincide with every CPR cardholder's recertification date ("Revising protocols," 2010). Should changes occur to CPR guidelines four months after an individual receives a CPR card, that provider could potentially go unevaluated on the new skills for 20 months ("Revising protocols," 2010). Often a training session is delivered to providers for the purpose of highlighting changes in protocol, however, if all members of an organization are not captured with the training update, the missing members will potentially have provided care based on outdated practices ("Revising protocols," 2010).

Acadian Ambulance ensured its providers were evaluated for skills and knowledge competency every year ("Acadian ambulance," 2012). Acadian provided training on a quarterly basis and one of those quarterly sessions provided the organization's leadership with an opportunity to evaluate employee skills and knowledge ("Acadian ambulance," 2012). Conducting the assessment every twelve months ensured EMS fundamentals were evaluated, organization protocols were understood, and performance benchmarks were met ("Acadian ambulance," 2012).

Prehospital educator, Mike Grill, found that evaluating EMTs on an annual basis was an ideal cycle to conduct assessments (M. Grill, personal communication, January 25, 2017). Grill considered more frequent evaluations when: (a) new employees joined an organization, (b)

medical protocols received updates, and (c) to verify competence of physician approved EMT scope of practice increases (M. Grill, personal communication, January 25, 2017).

The final research question addressed in this ARP was, "What are the financial costs and time required to administer a regularly, recurring, EMT assessment program?" The web-based literature review provided limited information directly related to this question. Additionally, interviews with EMS supervisors, prehospital educators, and indirect subject matter, all provided insight into this question.

During an interview with Dan Paddock, a supervisor with a private ambulance company in Denver, he explained that the cost associated with assessing an EMT employee was $500 per year (D. Paddock, personal communication, January 25, 2017). Paddock shared that annual costs further increased for newly hired employees when considering the added expense of an initial six-week training and field evaluation program. (D. Paddock, personal communication, January 25, 2017)

Larkspur Fire Protection District's Training Officer, Paul Hartigan, provided insight into the cost and time requirements for assessment of EMS skills in his combination department. Annual assessments at Larkspur Fire required EMTs to participate in an evaluation process four hours in length (P. Hartigan, personal communication, January 24, 2017). Hartigan explained that this time requirement increased if remediation was required. Training Officer Hartigan stated that Larkspur Fire Protection District's yearly evaluation cost was $240 per student. This dollar value was derived from the cost of paying overtime to personnel conducting the evaluation (P. Hartigan, personal communication, January 24, 2017).

The journal, *Nursing Economics*, discussed a cost model built to identify hospital education expenditures. The following categories were identified as budget line items to be considered for

planning of expenses associated with an education evaluation program: “program coordinator,” “lecture-associated outlays,” “supervisor expenses,” “supplies,” and “supporting personnel” (Bjork et al., 2009, p. 242).

Much of the literature review process identified information that detailed criteria for NREMT and state recertification requirements. One limitation noted was the literature review process found limited published work available directly tied to how individual EMS agencies conducted internal evaluations of their EMTs. Interviews with individuals directly involved in the management of EMS agencies, provided specific insight to the ARP questions. Additionally, professions such as military aviation and scientific laboratories all provided relevant insight to evaluation procedures conducted in fields other than EMS.

Procedures

Action research methodology was conducted to solve a current problem at FFPD. The intent of the ARP was to develop an internal procedure for skill and knowledge evaluation of district EMTs. Two regional questionnaires and an internal survey were utilized for the purpose of compiling information to develop a solution to the ARP problem. A literature review was conducted at the National Fire Academy, Denver Public Library, online search engines, and through personal interviews. The questionnaires and survey developed for this ARP were designed with the intent of gathering information on the thoughts, attitudes, experience, and procedural information related to EMT skill and knowledge evaluations.

One questionnaire used in the ARP, targeted a respondent population comprised of prehospital educators. The educators were individuals that had worked in the EMS field for many years and were now employed in roles to represent both hospitals and physicians that provide medical direction for EMS agencies. Five educators were selected from this population

to gain perspective from experienced instructors located throughout the Denver metropolitan area. This group of respondents was strongly familiar with the *Denver Metro Protocols*, understood NREMT and Colorado EMT recertification requirements, and provided support to a variety of EMS agencies. To isolate questionnaire responses to participants familiar with the regional EMS requirements found in the Denver area, educators outside this region were not solicited for input.

The *Research Questionnaire for EMS Prehospital Educators in Denver Area* (Appendix A) was administered to four individuals. A total of five educators were solicited for participation in the questionnaire, however, one person did not participate for unspecified reasons. The process of collecting data for the questionnaire began on January 24th, 2017, and was completed on January 25th, 2017. Similar to the following supervisor questionnaire, educators invited to respond were restricted to organizations operating in the Denver metropolitan area. The educator questionnaire had a participation rate of 80%.

A second questionnaire was administered to supervisors responsible for management of EMS agencies in the Denver metropolitan area. The *Research Questionnaire for EMS Supervisors in Denver Area* (Appendix C) was administered to seven individuals. The supervisor participants were identified for inclusion in the questionnaire because they fulfilled an EMS supervisory role, were familiar with the *Denver Metro Protocols* and understood recertification requirements specific to EMTs. Additionally, these seven respondents represented a diverse sampling of agencies responsible for EMS in the Denver region. The agencies represented included large and small organizations, government entities and a private ambulance company, as well as combination and career fire service agencies. The process of collecting data for the supervisor

questionnaire began on February 24th, 2017, and was completed on February 27th, 2017. One hundred percent of supervisors requested to participate in the questionnaire did so.

Participants of both questionnaires were contacted by phone or email to coordinate an interview time. Participants were provided the choice of answering with anonymity or approving to have their name and organization identified in the ARP. Information gathered during each interview was documented in hand-written notes and then converted to electronic format (Appendices B and D).

Both questionnaires were limited by each participant's understanding of every question and the participant's allotted interview time affording them an opportunity to engage in the interview process fully. An assumption of both interview-led questionnaires was that participants would answer honestly, openly, and without malicious intent. Limitations of the questionnaires included having additional time to interview increased numbers of participants and restricting inclusion of participants to the Denver metropolitan area.

An internal survey was conducted of all current EMTs serving at FFPD. A total of 47 members were included in the anonymous survey facilitated through the web site SurveyMonkey®. The survey, titled *Fairmount Fire Protection District Internal Questionnaire* (Appendix E), consisted of ten multiple choice questions designed to gain insight into the attitude, belief, and opinion of each district EMT. The survey invitation was emailed to district EMTs on January 26th, 2017, and the survey closed February 3rd, 2017. Of the 47 EMTs invited to participate, 46 completed the survey resulting in a 97.8 % completion rate. The survey exceeded the 95% confidence level statistical benchmark. The results of the survey were compiled and consolidated in the *Fairmount Fire Protection District Internal Questionnaire Results* (Appendix F).

Limitations to the FFPD internal survey included technical difficulty with one survey recipient's ability to participate, participants' ability to understand each question, and the survey settings did not allow participants the option of changing an answer once submitted. Assumptions to the internal survey include each participant answering honestly and the participant's motivation to contribute meaningful answers to each question.

Results

This ARP presented four questions to be addressed. The first question asked if EMS agencies should conduct regular and recurrent formal assessment of EMTs. Respondents of both questionnaires indicated with 100% agreement that frequent evaluations should occur (Appendices B and D). However, 10.9% of EMTs at FFPD did not think an assessment process should occur, nor did they believe evaluations would improve their EMT skill and knowledge (Appendix F). When asked if an evaluation process would improve the practical skills and understanding of prehospital medical protocols, 91.3 % of FFPD EMTs believed they would see self-improvement in these areas (Appendix F).

Question two of the ARP targeted the identification of skills and knowledge that should be evaluated as part of an EMT assessment procedure. The internal survey did not address this question, however, a consistent theme shared by both questionnaire populations was the opinion that evaluations should target fundamental EMT skills such as ventilation, cardiac arrest management, and knowledge of medical protocols (Appendices B and D). The combined response from educators and supervisors indicated 60% believed NREMT psychomotor skill stations should be included in the skill assessment. Combined responses from both questionnaire participants revealed 30% thought skills should be tested as a team, 40% felt individual testing should occur, and 30% thought the content being evaluated should determine if team or

individual assessment occurred (Appendices B and D). Answers from EMS supervisors identified that 50% of the respondents' organizations had physician advisors that provided specific direction and clear expectations for assessment of skills and knowledge evaluations (Appendix D).

The third question asked in this ARP regarded the frequency for which assessment of EMTs should occur. Results of the FFPD internal survey (Appendix F) identified 58.7% of survey respondents chose to test every 12 months. Additionally, 21.7% of EMTs chose a frequency equal to 18 months or greater, 17.3% selected the option to conduct evaluations every six months, and 2.2% picked testing every three months (Appendix F).

Three supervisors stated that facilitation of evaluations only occurred upon EMT certification renewal. Two supervisors indicated their organizations conducted skill testing annually and one EMS manager explained that EMTs were evaluated biannually. Half of prehospital educators stated evaluations should be conducted annually unless problems were identified, protocols significantly changed, or the quality assurance process identified topics needing more frequent assessment. Of the remaining two educators, one believed in biannual testing and the other suggested quarterly testing as the ideal cycle for recurrent evaluations.

The fourth question posed in this ARP identified the financial cost and time required to administer an EMT assessment program. EMS agency supervisors provided a spectrum of answers based on the unique mechanism utilized for evaluation of EMTs at their organization. Dollar costs shared per student ranged from $0-500 annually. Supervisors that stated no dollar value could be associated with EMT assessment explained that either an EMS officer administered the evaluation as part of that officer's job description, or on duty personnel were used to facilitate the evaluation. Supervisors that noted administration costs between $240-500

attributed this expense to paying overtime to assessor personnel or test takers. Prehospital educators were not asked this question because their services did not come with a direct out of pocket cost to EMS agencies.

When asked the amount of time required to administer an evaluation program, the answer ranged between 1-50 hours annually. Five agency supervisors provided annual time requirements ranging from 1-4 hours per year, one agency stated the question was not applicable, and one supervisor identified 50 hours per person annually when considering the time required for the evaluation of new employees (Appendices B and D).

Information collected from both questionnaires and the survey, provided data to develop an internal procedure (Appendix G) for annual assessment of EMT skills and knowledge. This procedure acknowledged that FFPD works in an EMS system with frequent changes to medical protocol and scope of practice. Partnered with St. Anthony's prehospital educators, FFPD implemented a procedure that administered an EMT skill and knowledge evaluation annually. During the first quarter of each calendar year, EMTs were required to pass a written protocol test. During the third quarter of each calendar year, a practical skills assessment was scheduled. FFPD medical director approved test bank questions were utilized for the written exam.

Discussion

The intent of this ARP was to utilize action research for the development of an EMT skill and knowledge evaluation procedure. Completion of the literature review, EMS supervisor questionnaire (Appendix D), prehospital educator questionnaire (Appendix B), and an internal survey of FFPD EMTs (Appendix F), all suggested that implementation of an assessment process would serve as an effective tool to measure performance and confirm skill competency.

EMT minimum recertification requirements have been established at both state and national levels, however, each EMS agency must determine if minimum EMT competencies are an appropriate benchmark. Dave Sanko (personal communication, January 25, 2017) observed that minimum EMT psychomotor skill competency, as defined by NREMT, is often not an appropriate minimum performance level for many EMS agencies. Sanko explained that progressive EMS systems, such as those found throughout the Denver metropolitan area, must have an evaluation mechanism appropriate for the increased EMT scope of practice (D. Sanko, personal communication, January 25, 2017).

Organizations, such as the National Fire Protection Agency (NFPA), provide guidance for facilitation of training and performance evaluations. *NFPA 450* stated that medical direction should ensure competency of providers appropriate to the certification level held (National Fire Protection Agency, 2017). However, *NFPA 450* did not provide specifics regarding how an evaluation should be accomplished. The process for conducting an assessment has been left to individual agencies to determine. Marinucci (2003) explained that routine testing of personnel is critical for an agency's leadership to effectively gauge member performance. Marinucci emphasized the importance of regular assessment, particularly in the context of an organization experiencing frequent change (Marinucci, 2003). The situation described by Marinucci is relevant to FFPD because medical protocols are updated every six months, new members are brought into the organization with limited experience, and low call volume provides limited opportunity to reinforce medical skills. Conducting regular recurrent assessment of FFPD EMT skills will provide a measurement tool to confirm performance benchmarks are being achieved.

Historically, FFPD had facilitated an evaluation of EMT skill and knowledge only when an individual was required to demonstrate skill proficiency as part of a recertification process. Two

Colorado requirements for EMT recertification are for the candidate to complete 36 hours of training in the three-year certification cycle and each applicant must demonstrate skill competency (Emergency Medical Services, 2006/2016). These Colorado EMT recertification requirements fit Slinkard's (2012) description of volume-based training. That is to say, an EMT pursuing recertification must accomplish a given number of training hours by the end of a specified period. Navy pilot, Lieutenant Commander Smith (2012), highlighted a flaw in volume-based training when he described aviators that achieved minimum requirements by piloting a handful of flights that were each long in duration. Slinkard (2012) and Smith (2012), explained that a more consistent and effective option was to implement frequency-based training. Both aviators believed regular and recurrent demonstration of skills resulted in pilots that maintained higher levels of proficiency. Slinkard identified the importance of confirming pilot competency every few months rather than what he described as the less effective process of volume-based training (Slinkard, 2012).

Prehospital educators Mike Grill (2017) and Dave Sanko (2017) observed that conducting EMT evaluations every two to three years was not frequent enough to be effective. Both educators stated that annual assessment of EMT skill and knowledge was an appropriate length of time. The FFPD internal survey (Appendix F) indicated 89.2% of EMTs believed evaluations should be conducted and that frequent assessment would improve their skill and knowledge. Almost 60% of FFPD EMTs answered that the ideal schedule for participation in evaluations should occur on an annual basis (Appendix F). From end user to administrator, the bulk of respondents contributing to this ARP indicated that an annual assessment of EMT skills and knowledge would be a useful mechanism for ensuring competency. There appears to be

agreement between unrelated professions, that frequent evaluations are an important aspect of ensuring minimum skills and knowledge competency.

Interviews with prehospital educators and EMS supervisors indicated that conducting evaluations of EMT psychomotor skills merited facilitation through both team scenarios and individual skill assessment (Appendices B and D). Jeremy Metz (personal communication, January 25, 2017), of West Metro Fire Rescue, explained that scenarios run by engine companies provided the evaluator with a mechanism to gauge care of the entire medical incident. However, Metz acknowledged that specific skills, such as insertion of a supraglottic airway, required individual assessment.

Amar Patel's article, *How simulation can refine individual and team skills competencies,* supported Metz's position regarding the benefit of conducting evaluations as a team. Patel (2016) observed that simulations conducted by teams, and individuals, both have merit depending on the intent of the assessment. Evaluating an engine company's management of a cardiac arrest scenario allows for assessment of communication, teamwork, and delegation of assignments. These intangible aspects of a medical call are effectively observed and assessed through a team scenario. For this reason, FFPD has included scenarios in its EMT evaluation that require groups of three to four people to manage a simulated patient. Individual skill stations remain included in the assessment to ensure an evaluator can confirm competency of each EMT for specific procedures such as airway placement.

A review of respondent answers from the EMS supervisor questionnaire (Appendix D), provided insight into the anticipated cost and time required to administer an EMT evaluation. Larkspur Fire Protection District's Paul Hartigan (personal communication, January 24, 2017), stated that his cost for facilitating EMT evaluations came from overtime wages for the evaluator.

Hartigan explained that the time required to administer an EMT evaluation process was four hours per student (personal communication, January 24, 2017). Elizabeth Fire Protection District's Sean Mackall explained that Elizabeth Fire conducts evaluations of EMTs every year. Mackall utilized on duty personnel to eliminate the requirement for paying overtime. An assessment was scheduled on each of Elizabeth Fire's shifts and took approximately one hour to complete (S. Mackall, personal communication, January 25, 2017). Acadian Ambulance provided another example of an agency that has chosen to evaluate its prehospital providers on an annual basis ("Acadian ambulance," 2012).

Several EMS agencies, reviewed as a part of the literature review process, utilized testing on an annual cycle as the timeline to conduct evaluations of medical skills and knowledge. Considering agency factors such as low annual call volume and biannual updates to the *Denver Metro Protocols*, FFPD has chosen to implement EMT skills and knowledge evaluations at a similar frequency.

One procedure that occurs at FFPD on a recurring annual cycle is the mandatory wildland refresher training conducted each year. Each member of FFPD is required to participate in one of three scheduled training sessions to remain qualified as a wildland firefighter. This format of mandatory annual training has been applied to the procedure directing annual EMT skill and knowledge evaluations. The chief officer responsible for EMS will administer an annual EMT assessment to each shift. Requiring all district EMTs to attend one of the scheduled shift trainings would capture everyone needing to be evaluated and do so without the district having to incur overtime cost.

It is anticipated that an EMT evaluation process would take between two and three hours per person. One hour would be required for participants to complete a written open-book protocol

test. Approximately two hours would be required to administer scenario-based skill evaluations. The estimated time to complete evaluations does not consider grading of written exams or remediation for performance deficits identified during the skills stations. The questionnaire results showed that 91.3 % of FFPD EMTs believed their EMS skills and knowledge would improve as result of participation in a medical skills evaluation (Appendix F).

Additional cost savings can be inferred from the potential reduction in exposure to liability. Guo et al. (2014), noted that water sampling laboratories had a higher risk of liability for failing to meet minimum standards during an evaluation of the laboratory's technical ability. It is reasonable to apply similar logic to EMS. Regular and recurrent use of an EMT assessment procedure will require each EMT to demonstrate performance at a benchmark set higher than Colorado or NREMT minimum requirements. Achievement of this raised performance standard should result in improved EMT care. Additionally, in the event a mistake is made during treatment, any potential investigation will identify that FFPD utilized frequent testing to confirm provider competency.

Escott shared a similar assessment procedure often required of medical doctors. Escott (2015), explained that physicians held certification that confirmed they were licensed, however hospitals still elect to evaluate the physician's competency. Successfully passing the hospital administered competency assessment provided the medical doctor with the credentials to practice medicine at the hospital in question (Escott, 2015). The concept of credentialing is relevant to EMS agencies.

Possession of certification such as EMT, does not unequivocally infer competence. Implementation of an EMT evaluation procedure at FFPD has effectively mirrored the credentialing process used by physicians. The implemented EMT assessment procedure

provided FFPD with documented confirmation of annual skills and knowledge competency. Furthermore, having implemented EMT evaluations on an annual basis increased the frequency of testing by a factor of three. The increased frequency of assessment may result in improved EMT skill competency, similar to that seen in aviator performance as observed by Lieutenant Commander Smith (2012).

Recommendations

The intent of this ARP was to utilize action research methodology to develop an internal procedure for skills and knowledge evaluation of district EMTs. The literature review, questionnaires, and EMT survey all assisted in the development of an internal procedure. Based on conducted research, four recommendations have been made.

First, FFPD should assess the effectiveness of the implemented internal procedure developed for annual evaluation of district EMTs. Feedback from FFPD personnel of all ranks could provide insight that will allow for improvement to the newly implemented procedure.

Second, FFPD should administer the internal survey again, for the purpose of evaluating changes in EMT opinions. Conducting serial surveys can provide FFPD with data to identify trends in the attitude and beliefs of district EMTs. Repeated annual use of the FFPD EMT survey will provide EMS program administrators with data to guide decisions allowing for refinement of the EMT assessment procedure.

Third, future research related to the subject matter of this ARP should consider perspectives from EMS leaders located beyond the Denver metropolitan area. The inclusion of survey and questionnaire participants from across the country may provide additional perspective and insight not captured by the research conducted in this ARP.

Fourth, further research should be considered for the relationship between agency conducted skills evaluation and the agency's exposure to liability. Conducted research for this ARP identified the relationship between skills testing and liability as an area that could be further explored.

The purpose of this research was to utilize action research methodology to develop an internal procedure for skills and knowledge evaluation of district EMTs. An EMT skills and knowledge procedure was implemented as a result of the research conducted. Regular and recurrent use of the implemented EMT assessment process should assist in the accomplishment of agency defined performance benchmarks.

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Appendix A

Research Questionnaire for EMS Prehospital Educators in Denver Area

Supervisors from various EMS agencies in the Denver metropolitan area will be asked the following questions.

1) Should your EMS agencies conduct regular, recurring, skills and knowledge assessment of their EMT's? If so, how often? If not, why not?

2) Should your EMS agencies accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

3) What EMT job performance skills should be assessed during skills/knowledge assessment?

4) Does the physician advisor group you represent have specific requirements for skills/knowledge check of its agencies?

5) How should skills be assessed?

6) Should EMT's be assessed as individuals or is it appropriate to test teams of EMT's? (pass as a group, fail as a group)

7) How should an agency measure or define passing of skills assessment?
8) Who should conduct the assessment?

9) In the event of a skills failure or deficit what should be the next step?

10) Should your agencies conduct DMP testing for each EMT? How should this test be conducted? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

11) If resources are used, should the standard for passing be raised? If so, to what?

12) Does your organization have resources available to assist EMS agencies in conducting skills and knowledge assessment? If so what are the resources?

Appendix B

Research Questionnaire Results for EMS Prehospital Educators in Denver Area

Research Questionnaire # 1 of 4

Supervisor: Anonymous
Agency: Anonymous
Time of interview: 1/24/17 @ 1220
Interview format: Phone interview with written notes

1. Should your EMS agencies conduct regular, recurring, skills and knowledge assessment of their EMT's? If so, how often? If not, why not?
    a. Yes, annually.

2. Should your EMS agencies accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?
    a. No. Don't believe an assessment once every 2-3 years is sufficient for proficiency of skills. No evidence to show that skills testing every 2-3 years works. But volunteers can be challenging to regularly and routinely assess due to their time constraints. Current skills assessment from another agency could be considered acceptable.

3. What EMT job performance skills should be assessed during skills/knowledge assessment?
    a. Lifesaving skills. CPR, AED, Ventilation, Tourniquet, Waiver medications and procedures such as nitro, albuterol, epi. Stations should include Trauma scenario, medical scenario, cardiac arrest scenario, and vital sign assessment.

4. Does the physician advisor group you represent have specific requirements for skills/knowledge check of its agencies?
    a. No.

5. How should skills be assessed?

   a. Dedicated day of skills review. Volunteers that miss this date should be captured at other EMS trainings.

6. Should EMT's be assessed as individuals or is it appropriate to test teams of EMT's? (pass as a group, fail as a group)
   a. Ideally individual, CPR rotate crew.

7. How should an agency measure or define passing of skills assessment?
   a. Meet AHA requirements, Perform skills within standards of behavior. Subjective evaluation of procedures performed within reasonable amount of time.

8. Who should conduct the assessment?
   a. Medical director or their agent, someone at or above the skill level being evaluated and that is also an instructor, experienced provider of higher certification. Ideally one person is designated.

9. In the event of a skills failure or deficit what should be the next step?
   a. Remediate and retest.

10. Should your agencies conduct DMP testing for each EMT? How should this test be conducted? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)
    a. Yes. Open and closed book portions that cover the material they should know. Hospital specific protocols, approximately 25 questions. Example: List three cases where unusual circumstances report should be completed. Open book or smart phone should have passing score of 90% correctable to 100%. This requires the test taker to dig into the protocols and understand where to find the information.

11. If resources are used, should the standard for passing be raised? If so, to what?
    a. See question #10.

12. Does your organization have resources available to assist EMS agencies in conducting skills and knowledge assessment? If so what are the resources?
    a. Yes. Agency assigned educator, other personnel, materials, advanced manikins.

Research Questionnaire for EMS Prehospital Educators in Denver Area
Research Questionnaire # 2 of 4

Supervisor: Mike Grill
Agency: Centura Health Prehospital Services
Time of interview: 1/25/17 @ 1445
Interview format: Phone interview with written notes

1) Should your EMS agencies conduct regular, recurring, skills and knowledge assessment of their EMT's? If so, how often? If not, why not?

   Monthly or as need are identified. Also as new treatment or protocols are introduced. Yearly topics spread out over 12 months.

2) Should your EMS agencies accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. Because I don't know the skill set of the evaluator that issued the certification.

3) What EMT job performance skills should be assessed during skills/knowledge assessment?

   NREMT requirements, CO requirements, local protocols. For example, the Sepsis project required waivers and education to ensure providers new how to do it. Potentially prehospital ultrasound use being looked at currently.

4) Does the physician advisor group you represent have specific requirements for skills/knowledge check of its agencies?

   ABC's, critical skills sets like cardiac arrest.

5) How should skills be assessed?

   Simulation lab is gold standard. Watch recording and provide feedback.

6) Should EMT's be assessed as individuals or is it appropriate to test teams of EMT's? (pass as a group, fail as a group)

   Both appropriate. Could integrate into MCI drill to combine team and individual assessment.

7) How should an agency measure or define passing of skills assessment?

   Establish minimum standard, use NREMT critical criteria, didactic portion to level of competency.

8) Who should conduct the assessment?

   Department training officer in conjunction with medical director

9) In the event of a skills failure or deficit what should be the next step?

   Remediation, Identify problem then immerse test taker right back into similar situation.

10) Should your agencies conduct DMP testing for each EMT? How should this test be conducted? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    Yes. Didactic and practical. Demonstrate means hands-on testing. Identify means list answers on written test. Medical director should vet the test.

11) If resources are used, should the standard for passing be raised? If so, to what?

    Answer not documented.

12) Does your organization have resources available to assist EMS agencies in conducting skills and knowledge assessment? If so what are the resources?

    Yes. Equipment, testing, help run scenarios, having a medical director is powerful. The MD can facilitate remedial training with anesthesiologists for airway skills practice.

Research Questionnaire for EMS Prehospital Educators in Denver Area
Research Questionnaire # 3 of 4

Supervisor: Dave Sanko
Agency: Centura Health South Denver Group
Time of interview: 1/25/17 @ 1032
Interview format: Phone interview with written notes

1) Should your EMS agencies conduct regular, recurring, skills and knowledge assessment of their EMT's? If so, how often? If not, why not?

   Yes. Ideally every 6 months. Annually conduct skills rodeo using NREMT practical. These annual skills could be broken over the year.

2) Should your EMS agencies accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. EMT is bare minimum. Need to maintain skills competency.

3) What EMT job performance skills should be assessed during skills/knowledge assessment?

   NREMT 6 station skills practical, might be eight stations. Assess medical and trauma patients, BVM, AED, C-spine immobilization, Bleeding Control.

4) Does the physician advisor group you represent have specific requirements for skills/knowledge check of its agencies?

   Skills evaluation annually.

5) How should skills be assessed?

   Scenarios, skills rodeo. Not a fan of a single skill check off station. Incorporate skills being tested into a scenario. Be able to manage the whole patient.

6) Should EMT’s be assessed as individuals or is it appropriate to test teams of EMT’s? (pass as a group, fail

as a group)

Teams. Although we need to be cognizant of the EMT hiding in the group. Ensure no one gets to hide in the team passing.

7) How should an agency measure or define passing of skills assessment?

NREMT practical sheets.

8) Who should conduct the assessment?

Representative of the Medical Director or third party.

9) In the event of a skills failure or deficit what should be the next step?

Remediation. Identify the problem, talk with the offender. Did they realize what went wrong? Is it a base knowledge issue. Fix it. Monitor Performance for a pattern. Idea of "Just culture." Was it a knowledge issue, equipment issue, or repeated behavior?

10) Should your agencies conduct DMP testing for each EMT? How should this test be conducted? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

Yes. Organization or hospital can conduct the test. There is an online test bank for DMP. EMT should be allowed to use resource in order to reinforce familiarity with protocol. Increase passing standard for open book. Closed book should be 80%

11) If resources are used, should the standard for passing be raised? If so, to what?

See question #10.

12) Does your organization have resources available to assist EMS agencies in conducting skills and knowledge assessment? If so what are the resources?

Yes. Hospital bank of DMP questions. Assistance with practical's. Educator assigned to agency can help to coordinate CE's and testing. Can bring multiple instructors/evaluators.

Research Questionnaire for EMS Prehospital Educators in Denver Area
Research Questionnaire # 4 of 4

Supervisor: Anonymous
Agency: Anonymous
Time of interview: 1/24/17 @ 1520
Interview format: Phone interview with written notes

1) Should your EMS agencies conduct regular, recurring, skills and knowledge assessment of their EMT's? If so, how often? If not, why not?

   Yes, quarterly would be ideal. Three of his agencies have assessments and two agencies do not.

2) Should your EMS agencies accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. Skills testing needs to be done to confirm ability.

3) What EMT job performance skills should be assessed during skills/knowledge assessment?

   Lack of call frequency means skills not proficient. Build assessment process based on previous training and assessments. Low-frequency high-risk skills like crics.

4) Does the physician advisor group you represent have specific requirements for skills/knowledge check of its agencies?

   Physician advisor listens to the prehospital educators input and then decides direction of assessment and training. Expectations provided by doctor in fall for subsequent year.

5) How should skills be assessed?

   Use NREMT sheets modified for local use based no protocols and physician advisor.

6) Should EMT's be assessed as individuals or is it appropriate to test teams of EMT's? (pass as a group, fail as a group)

   Depends on skill being evaluated.

7) How should an agency measure or define passing of skills assessment?

   NREMT standards.

8) Who should conduct the assessment?

   Main educator and physician advisor. Use strong performers to assist in process.

9) In the event of a skills failure or deficit what should be the next step?

   Remediate and assign someone to work the person having problems

10) Should your agencies conduct DMP testing for each EMT? How should this test be conducted? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    Yes. Using smart phone or paper copy of DMP ok, just increase passing score. Written test and skills test of DMP, ideally twice a year. Discuss updates to DMP and then give DMP written exam.

11) If resources are used, should the standard for passing be raised? If so, to what?

    No.

12) Does your organization have resources available to assist EMS agencies in conducting skills and knowledge assessment? If so what are the resources?

    Yes. Simulator manikins, fake medications, borrow equipment from other agencies, tourniquet simulator.

Appendix C

Research Questionnaire for EMS Supervisors in Denver Area

Supervisors from various EMS agencies in the Denver metropolitan area will be asked the following questions.

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

3) What job performance skills do you assess during skills/knowledge assessment?

4) How do you conduct the skills test?

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

7) How do you measure or define passing of skills assessment?

8) Who conducts the assessment?

9) In the event of a skills failure or deficit what is the next step?

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

11) If resources are used, should the standard for passing be raised? If so, to what?

12) How many hours required to manage an EMT assessment program? Per student?

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

Appendix D

Research Questionnaire Results for EMS Supervisors in Denver Area
Research Questionnaire # 1 of 7

Supervisor: Jeremy Metz
Agency: West Metro Fire Rescue
Time of interview: 1/27/17 @ 1325
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   Yes. This occurs on recertification cycle. Two years for State certification and three years for NREMT.

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. Testing validates the individual's skills. Medical Director requires an evaluation.

3) What job performance skills do you assess during skills/knowledge assessment?

   Every three years a full blown EMT assessment takes place. This cycle lines up with recertification. Every two years BLS skills are evaluated department. There can be times where the two and three-year cycle overlap and both tests occur during the same year.

4) How do you conduct the skills test?

   Scenarios in small groups. Airway management is always tested. Manikins used. Going forward high fidelity manikins will be utilized.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   Yes

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Scenarios as a team, individuals rotate through positions in order to be evaluated.

7) How do you measure or define passing of skills assessment?

   This is gray area. Some testing is subjective.

8) Who conducts the assessment?

   EMS Training Lt. coordinates and proctors with the medical director's designee.

9) In the event of a skills failure or deficit, what is the next step?

   Case by case. Opportunity to retest two weeks later. A written plan is developed by the medical officer working with the person that failed.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    Existing members take a written paper test. The test is closed book and requires an 80% passing score. New hires have a task book to complete that includes testing of the Denver Metro Protocols.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    No use of resources. For areas where smartphone apps are encouraged in the field the test will not cover this material.

12) How many hours required to manage an EMT assessment program? Per student?

    2-3 hours per student annually.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    No additional cost besides what has been built into the job description of the EMS Lt. Support from the medical director's personnel also comes with no out of pocket cost. No overtime is provided to the test taker as this is exempted FLSA requirement.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    No labor management issues. Challenge is that testing only occurs every 2-3 years. Ideally testing would take place on an annual or biannual basis. The challenge with increasing the frequency of evaluations is the completion for time slots with other training that needs to occur.

Research Questionnaire for EMS Supervisors in Denver Area
Research Questionnaire # 2 of 7

Supervisor: Chris Malmgren
Agency: Pleasant View Fire Department
Time of interview: 1/27/17 @ 1310
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   Yes. Annually.

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   Yes.

3) What job performance skills do you assess during skills/knowledge assessment?

   Trauma and medical scenario.

4) How do you conduct the skills test?

   Practical scenarios.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   No.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Group.

7) How do you measure or define passing of skills assessment?

   NREMT practical forms.

8) Who conducts the assessment?

   Prehospital educators from Lutheran Hospital.

9) In the event of a skills failure or deficit, what is the next step?

   Given remedial training and then retake failed portion

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    No.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

    2 hours per student annually.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    None.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    None.

Research Questionnaire for EMS Supervisors in Denver Area
Research Questionnaire # 3 of 7

Supervisor: Dan Paddock
Agency: AMR
Time of interview: 1/25/17 @ 1230
Interview format: In person interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   Yes. QA/QI 80% of reports. Can identify skill set deficits based on documentation

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. This doesn't identify holes in skills.

3) What job performance skills do you assess during skills/knowledge assessment?

   Data drives the topic.

4) How do you conduct the skills test?

   Real life equipment, use live patients or sim manikins. Scenario driven.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   No.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Individuals.

7) How do you measure or define passing of skills assessment?

   Use NREMT practical sheets with 80% passing score.

8) Who conducts the assessment?

   Captains or above and the Continuing Education Manager along with his Field Training Officers.

9) In the event of a skills failure or deficit, what is the next step?

   Sent back as the third rider or monitored.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    Yes. Written. No resources allowed.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

    250 hours during first six weeks of employment for new hires. Annually each employee gets 50 hours of maintenance combined training and assessment.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    $500 per year per 50 hours of evaluation/education.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    Mandating OT or taking crews out of the field. Culture, "did I do something wrong"

Research Questionnaire # 4 of 7

Supervisor: Matthew Rettmer
Agency: Castle Rock Fire Department
Time of interview: 1/25/17 @ 1443
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   No. Only recertification for NREMT, not consistent. Feel CE's meet the needs of providers and keeps their skills currant.

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   Yes. Maintaining CE's required by certifications is enough.

3) What job performance skills do you assess during skills/knowledge assessment?

   Not applicable

4) How do you conduct the skills test?

   Not applicable.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   Not applicable.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Not applicable.

7) How do you measure or define passing of skills assessment?

   Not applicable.

8) Who conducts the assessment?

   Not applicable.

9) In the event of a skills failure or deficit, what is the next step?

   Not applicable.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

No. Routinely reviewing DMP through CE process.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

Not applicable.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

Not applicable.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

Not applicable.

Research Questionnaire for EMS Supervisors in Denver Area
Research Questionnaire # 5 of 7

Supervisor: Sean Mackall
Agency: Elizabeth Fire Protection District
Time of interview: 1/24/17 @ 1310
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

Yes, every six months

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

Yes, for new hires. Because to receive the certification you would have been required to be tested.

3) What job performance skills do you assess during skills/knowledge assessment?

NREMT practical stations and individual skills

4) How do you conduct the skills test?

   Practical scenario on manikin.

5) Does your physician advisor have specific requirements for a skills and knowledge assessment?

   No.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Individuals.

7) How do you measure or define passing of skills assessment?

   NREMT practical forms

8) Who conducts the assessment?

   Career cleared paramedics

9) In the event of a skills failure or deficit, what is the next step?

   Education, retake failed portion, individual will be given remedial training.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    No.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

    45 min to an hour

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    No cost, utilize on duty crew

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    Scheduling. Between paid and volunteer personnel with outside jobs it is hard to get everyone together for testing at one time.

Research Questionnaire for EMS Supervisors in Denver Area
Research Questionnaire # 6 of 7

Supervisor: Paul Hartigan
Agency: Larkspur Fire Protection District
Time of interview: 1/24/17 @ 1110
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   Yes. Based or State recertification (3 years) or NREMT certification (2 years).

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

Career and part-time yes. Volunteers, no because they do not need the certification.

3) What job performance skills do you assess during skills/knowledge assessment?

   Specific to the requirements for either state or NREMT recertification.

4) How do you conduct the skills test?

   NREMT practical stations.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   No.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Individuals.

7) How do you measure or define passing of skills assessment?

   NREMT practical skills sheets.

8) Who conducts the assessment?

   District paramedics or EMS certified instructors.

9) In the event of a skills failure or deficit, what is the next step?

Retrain in the specific deficit areas.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    No. If this test was given it should be closed book written test.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

    4 hours.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    $240 per student annually considering OT costs associated with assessors and their assistants.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    People that don't know the recertification assessment requirements.

Research Questionnaire for EMS Supervisors in Denver Area
Research Questionnaire # 7 of 7

Supervisor: Anonymous
Agency: Combination fire department
Time of interview: 1/24/17 @ 1050
Interview format: Phone interview with written notes

1) Do you conduct skills and knowledge assessment of your EMT's? If so, how often? If not, why not?

   Yes. Yearly skills evaluation circuit. Monthly test of skills, at the end of the year all skills have been covered. 100% of paid staff get evaluated, volunteers vary.

2) Does your organization accept a current Colorado EMT certification in place of regular skills & knowledge testing? Why or why not?

   No. Skills vary for each person.

3) What job performance skills do you assess during skills/knowledge assessment?

   Denver Metro Protocols. Bandaging, splinting, CPR, Med administration.

4) How do you conduct the skills test?

   Scenarios.

5) Does your physician advisor have specific requirements for skills and knowledge assessment?

   Yes. Waiver specific skills and medications.

6) Do you assess individuals or teams of EMT's? (pass as a group, fail as a group)

   Combination. Scenarios as a team, individual skills check off stations.

7) How do you measure or define passing of skills assessment?

   Do not use NREMT, Based no evaluated paramedics subjective review of each skill.

8) Who conducts the assessment?

   Career paramedic.

9) In the event of a skills failure or deficit what is the next step?

   Education, remediation, immediate training and repeat testing in many cases.

10) Do you conduct a Denver Metro Protocol test? How do you facilitate this test? Should test takers be allowed to use resources during the test? (Protocol app, DMP hard copy, etc.)

    Yes. Online, Use website "Noodle." Denver Metro Protocols are available to test online. Agency administrator fills out information for individuals needing evaluation and then the test taker can have access to the online exam. Results seen by administrator and test taker. No use of resources. In the field on calls, the provider can use resources.

11) If resources are used during test of the Denver Metro Protocols, should the standard for passing be raised? If so, to what?

    Not applicable.

12) How many hours required to manage an EMT assessment program? Per student?

    2-3 hours per student annually.

13) What is the financial cost of conducting an EMT skills and knowledge assessment?

    No additional cost besides on duty paramedics time. During hiring processes there can be additional costs with bringing in personnel to conduct evaluation and play the role of patients.

14) What challenges did your organization encounter during implementation of an EMT skills and knowledge assessment program?

    Challenge of culture and beliefs held throughout the organization. "Why do we need to do this?" Initially personnel resisted being evaluated and leadership did not see need for regular assessment of personnel.

Appendix E

Fairmount Fire Protection District Internal Questionnaire

1. Are you an EMT?

- o Yes
- o No

2. Should Fairmount Fire Protection District (FFPD) conduct a skills and protocol assessment of its EMTs?

- o Yes
- o No

3. Do you believe participating in an

EMT skills and knowledge assessment will improve your performance as an EMT?

- Yes
- No

4. Who should conduct the skills and knowledge assessment of FFPD EMTs?

- FFPD EMS division personnel
- Physician advisor or their designee
- Combination of FFPD personnel and physician advisor's personnel

5. How frequently should an assessment of FFPD EMTs occur?

- Every 3 months

- Every 6 months
- Every 12 months
- 18 months or greater

6. Should a Denver Metro Protocol (DMP) written exam allow for the use of resources such as a paper copy of the DMP or a protocol app on your smartphone?

- Yes
- No

7. Typical "closed book" DMP exams require a minimum passing score of

80%. What should the minimum passing score be for an "open book" DMP exam?

- 80%
- 90%
- 100%

8. Rate your own EMT hands-on skill set.

0----------100%

9. Rate your own knowledge of the Denver Metro Protocols.

0----------100%

10. Do you believe some type of regularly recurring EMT skills and knowledge

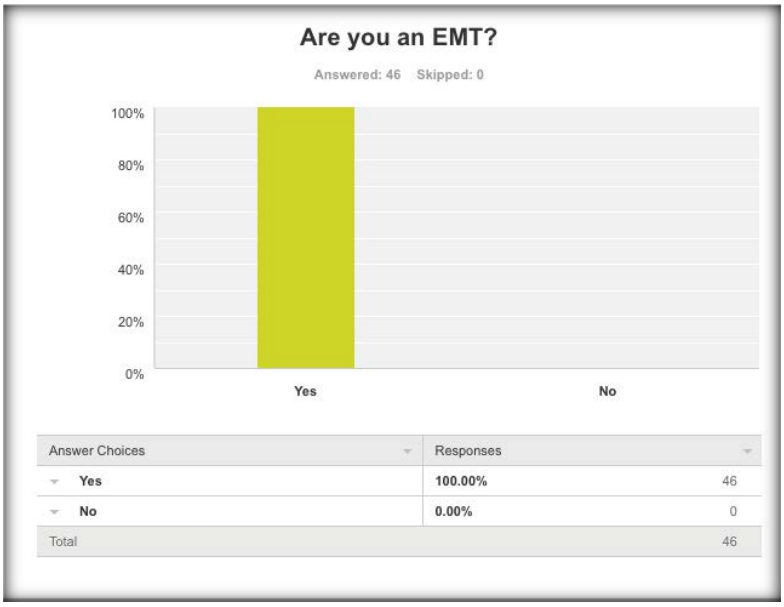
assessment will improve the self-rating you provided for questions #8 and #9?

- Yes
- No

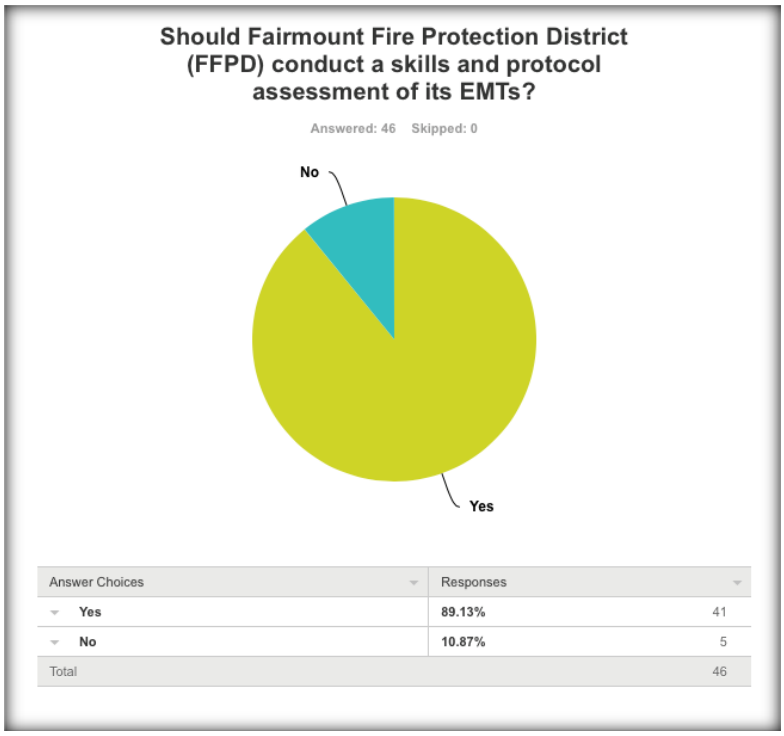
Appendix F

Fairmount Fire Protection District Internal Questionnaire Results

Question 1.

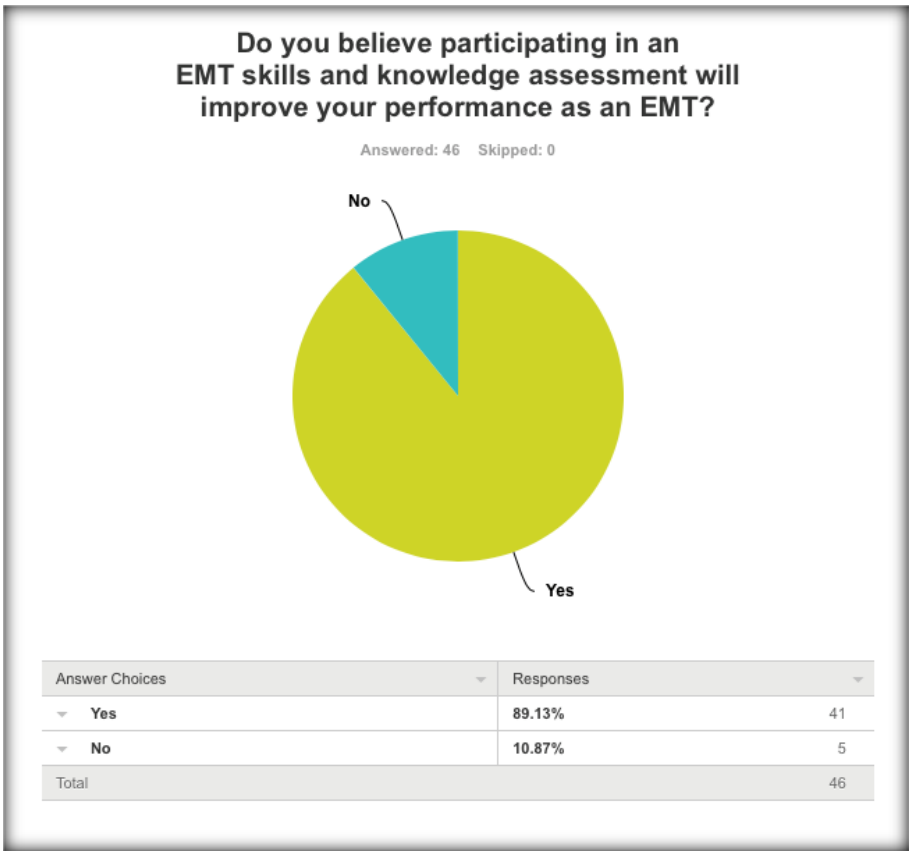


Question 2.



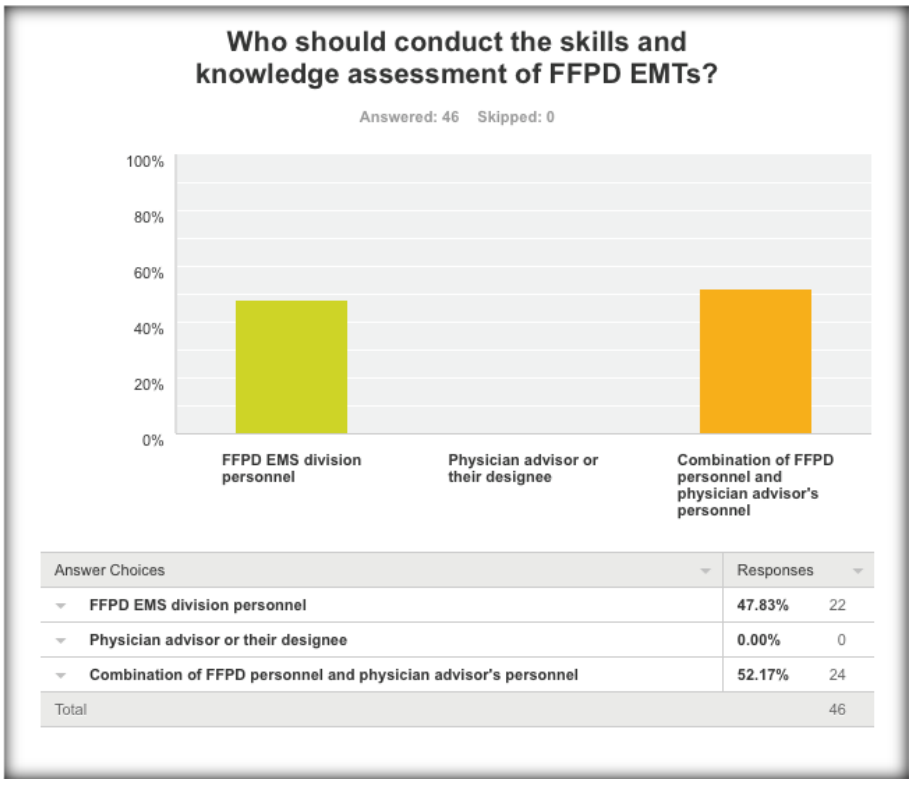
Answer Choices	Responses	
Yes	89.13%	41
No	10.87%	5
Total		46

Question 3.



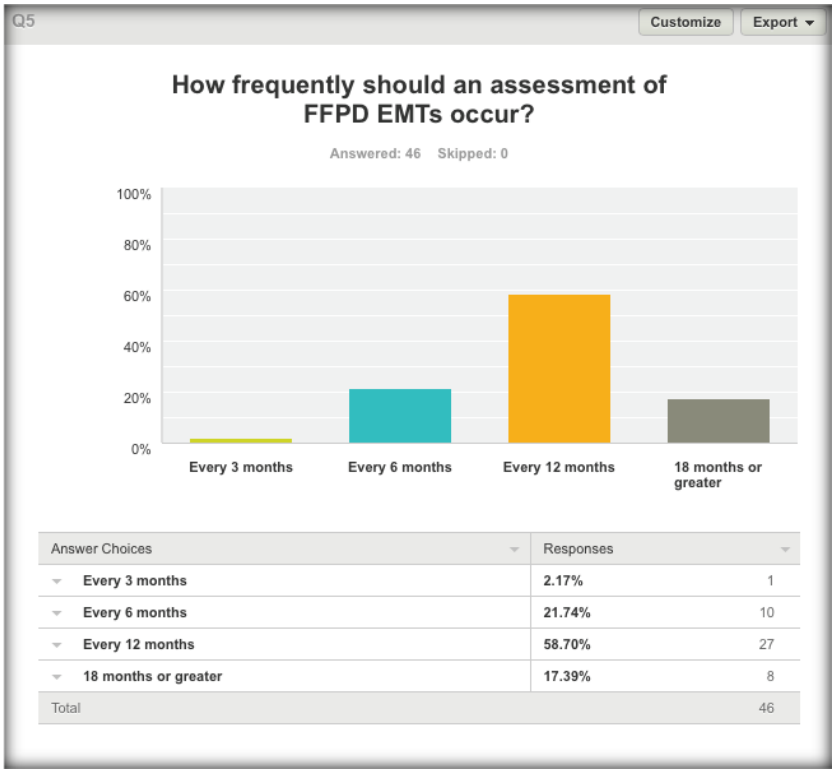
Answer Choices	Responses	
Yes	89.13%	41
No	10.87%	5
Total		46

Question 4.



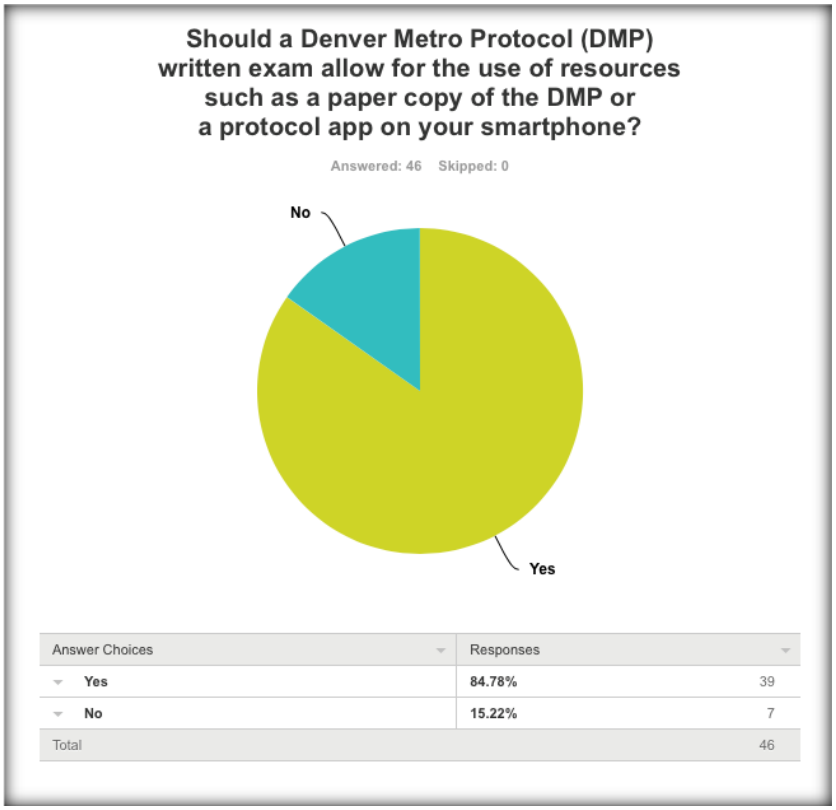
Answer Choices	Responses	
FFPD EMS division personnel	47.83%	22
Physician advisor or their designee	0.00%	0
Combination of FFPD personnel and physician advisor's personnel	52.17%	24
Total		46

Question 5.



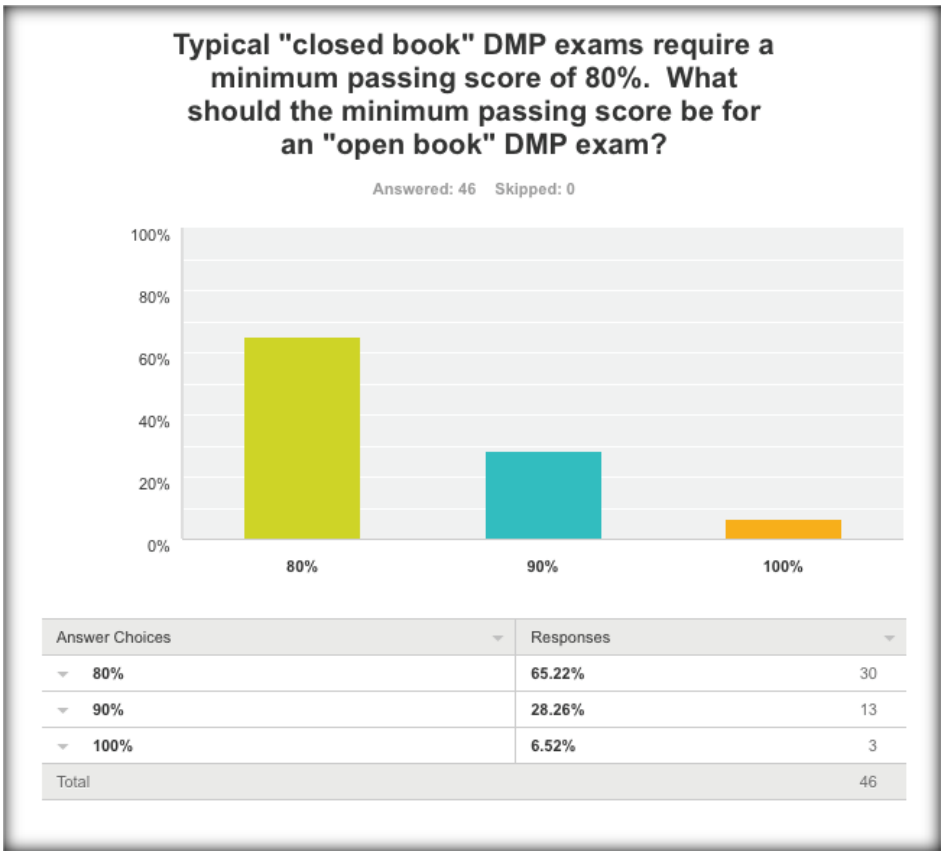
Answer Choices	Responses	
Every 3 months	2.17%	1
Every 6 months	21.74%	10
Every 12 months	58.70%	27
18 months or greater	17.39%	8
Total		46

Question 6.



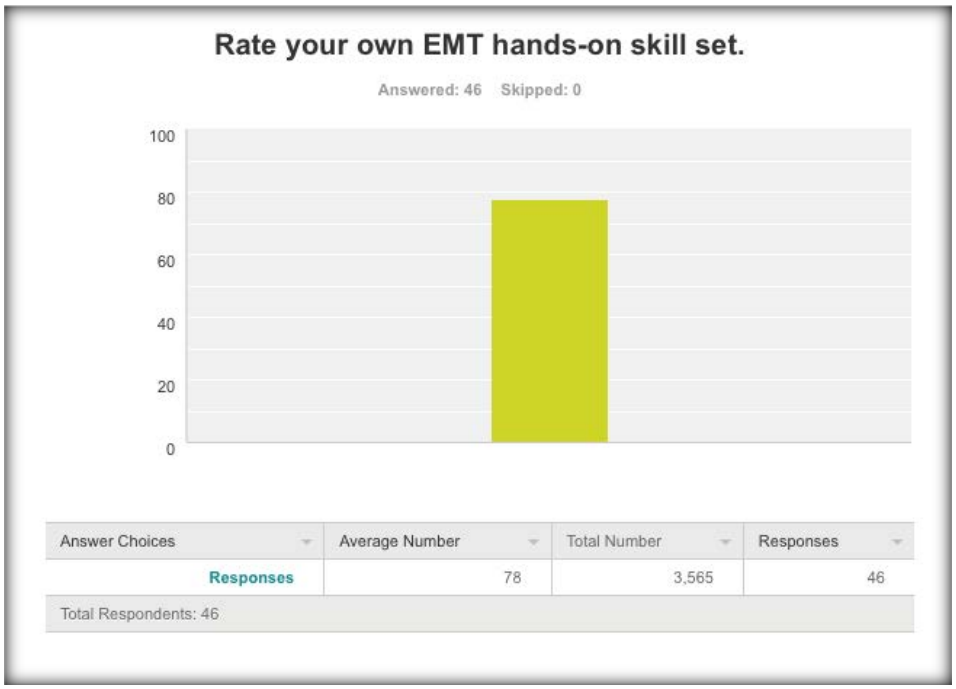
Answer Choices	Responses	
Yes	84.78%	39
No	15.22%	7
Total		46

Question 7.



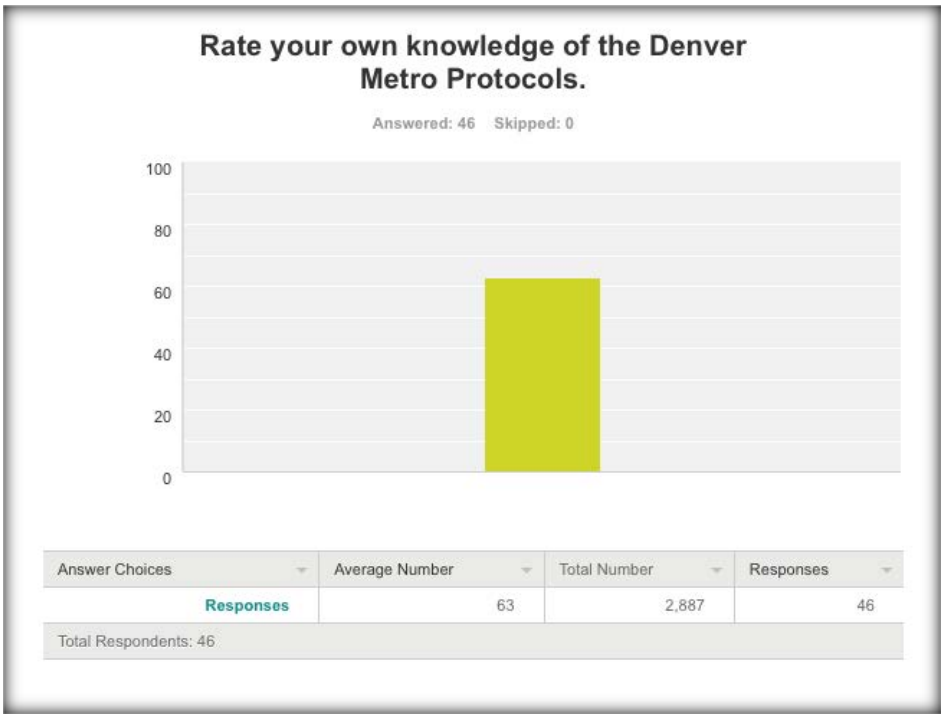
Answer Choices	Responses	
80%	65.22%	30
90%	28.26%	13
100%	6.52%	3
Total		46

Question 8.



Answer Choices	Average Number	Total Number	Responses
Responses	78	3,565	46
Total Respondents: 46			

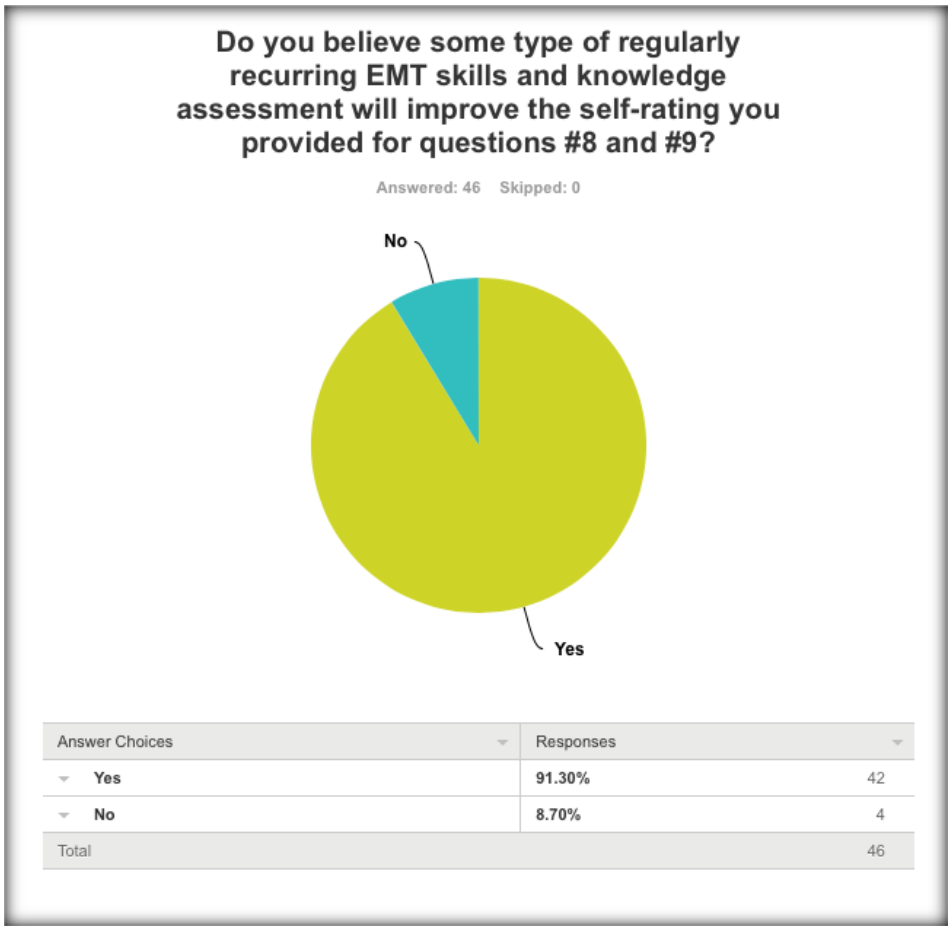
Question 9.



Answer Choices	Average Number	Total Number	Responses
Responses	63	2,887	46

Total Respondents: 46

Question 10.



Answer Choices	Responses	
Yes	91.30%	42
No	8.70%	4
Total		46

Appendix G

FAIRMOUNT
FIRE RESCUE

Date: February 13th, 2017

Subject: FFPD internal procedure for annual skill and knowledge evaluation of EMTs.

Purpose: The purpose is to provide regular evaluations of district EMTs to ensure a high competency level. FFPD prehospital providers work in a progressive EMS system with medical direction that permits an expanded scope of practice for the EMTs they oversee. Frequent evaluations provide an opportunity to confirm performance expectations are being achieved, identify areas needing development, and reinforce EMS best practices.

Procedure: FFPD and St. Anthony's Hospital (SAH) prehospital education group have developed the following process for the evaluation of district EMT skills and knowledge:

- Annual written evaluation of the EMTs knowledge will be conducted during the first quarter of each calendar year.
    - This test will assess aspects of the provider's general medical knowledge as well as each EMTs understanding of both the Denver Metro Protocol's (DMP) and agency specific SAH prehospital protocols.
    - The format of the exam will be "open book." Resources permitted include protocol app's, DMP pdf document on smartphone or tablet, and hardcopy of the medical protocols.
    - Exam questions can be multiple choice, true or false, matching, fill in the blank, and short answer format.
    - The "open book" written exam requires a score of 90%, correctable to 100%.
    - SAH will approve exam content.
- Annual psychomotor skills evaluation will be conducted during the third quarter of each calendar year.
    - This assessment will evaluate the EMTs practical application of medical skills.
    - The format of this hands-on testing will be both team scenario and individual skill station.
    - Assessment of EMT performance will occur through a combination of objective NREMT psychomotor skills sheet scoring and subjective evaluation of the EMTs performance.
    - An annual skills assessment will always include critical life saving skills such as ventilation and BLS airway placement, cardiac arrest scenario and

procedures approved by medical direction waiver. Additional "revolving' skills stations will be included each year on a skill-by-skill basis.

- The written exam and practical skills assessment will be accomplished annually by FFPD EMTs to remain in good standing with the districts medical director.
- New EMTs joining the organization, current district members that achieve initial EMT certification, and reinstated EMTs, all will be required to pass a written exam and practical skills assessment before being approved to work under FFPD's medical director.
- The medical director or their designee may participate in the annual evaluation process of EMTs.
- Participants will receive continuing education credit upon completion of a written or practical evaluation.
- Unsuccessful attempts to pass this annual evaluation will be addressed on a case-by-case basis. Generally, remediation will occur immediately, followed by retesting.
- FFPD and SAH will have the discretion to modify the evaluation schedule and process if needed. Should the evaluation process require modification, these changes will be communicated to district EMTs.