

**An Investigation of the Feasibility of Mobile Integrated Healthcare-Community
Paramedicine in the Jefferson Township Fire Department**

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

1. 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.

2. I have affirmed the use of proper spelling and grammar in this document by using the spell and grammar check functions of a word processing software program and correcting the errors as suggested by the program.

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ABSTRACT

The problem this study addressed was the Jefferson Township Fire Department did not know if they could afford to provide Mobile Integrated Healthcare – Community Paramedicine within their community. The purpose of this study was to investigate how to determine if there is a need for a MIH-CP program within the service area of the Jefferson Township Fire Department and whether a MIH-CP program was feasible by researching how to complete a cost-benefit analysis for Jefferson Township Fire Department to implement the program.

The evaluative research method was used to answer the following questions:

1. What is Mobile Integrated Healthcare-Community Paramedicine?
2. How do we determine what, if any services are needed in our community?
3. What are the most common Mobile Integrated Healthcare-Community Paramedicine Programs in existence?
4. How do we determine the cost-benefit analysis of implementing a Mobile Integrated Healthcare-Community Paramedicine program in the Jefferson Township Fire Department?

The researcher conducted reviews of various literature sources and sent out a nationwide survey targeting rural fire based EMS agencies providing MIH-CP programs. Because there were a limited number of emergency response agencies performing MIH-CP activities and even less that were rural fire-based EMS agencies, there was only one respondent that was able to complete the survey. More research was conducted and a summary of a MIH-CP survey conducted in 2015 by the National Association of Emergency Medical Technicians (NAEMT) was obtained and utilized for information.

Recommendations were made that more information needed to be gathered to properly address the problem. Future surveys and even interviews should be conducted to gather updated information. As programs in Ohio become established it will be easier to obtain the needed information.

It appears that MIH-CP is here to stay and since it is intended to improve our community's health and reduce the burden on our nation's healthcare system, the Jefferson Township Fire Department will continue to monitor the topic and gather information as to the feasibility of implementing a program. As a service provided to the community, there could be a value in garnering community support for the fire department which helps with other funding initiatives.

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INTRODUCTION

Statement of the Problem

The Jefferson Township Board of Trustees have identified another potential funding mechanism for the Jefferson Township Fire Department by starting a Mobile Integrated Healthcare-Community Paramedicine (MIH-CP) program; however, they do not have information pertaining to potential income, expenses, and operational changes associated with developing and sustaining a MIH-CP program. The problem this study will address is the Jefferson Township Fire Department does not know if they could afford to provide Mobile Integrated Healthcare – Community Paramedicine within their community.

Purpose of the Study

The purpose of this study was to investigate how to determine if there is a need for a MIH-CP program within the service area of the Jefferson Township Fire Department and whether a MIH-CP program is feasible by researching how to complete a cost-benefit analysis for Jefferson Township Fire Department to implement the program. The research will be used to determine if the Jefferson Township Fire Department will be starting a new healthcare delivery service.

Research Questions

Evaluative research will be conducted to answer the following questions:

1. What is Mobile Integrated Healthcare-Community Paramedicine?
2. How do we determine what, if any, services are needed in our community?
3. What are the most common Mobile Integrated Healthcare-Community Paramedicine programs in existence?

4. How do we determine the cost-benefit analysis of implementing a Mobile Integrated Healthcare-Community Paramedicine program in the Jefferson Township Fire Department?

BACKGROUND AND SIGNIFICANCE

Jefferson Township is located on the eastern edge of Madison County, 15 miles west of the state capital, Columbus, Ohio. Within Jefferson Township lies the Village of West Jefferson.

The Jefferson Township Fire Department was formed in 1947 as all volunteer fire department. As the emergency runs increased, the department started increasing coverage by first instituting part-time, then full-time personnel. The first full-time firefighters were hired in 1983. Currently, the department employs 14 full-time personnel and 30 part-time personnel. The fire department has three shifts, each with 4 fulltime personnel and two part time personnel staffing 24 hours a day, 7 days a week. There are two 40-hour personnel that perform administrative and fire prevention activities. The fire department operates out of one station, located in West Jefferson with three EMS vehicles, one fire engine, one 75' quint, one water tanker, one brush truck and two staff vehicles.

In addition to Jefferson Township, the fire department also covers Fairfield Township; an adjoining township located south of Jefferson Township. The total response area is 79 square miles and according to the 2010 census, the population of this area is 8577.

According to the department's 2013 annual report, the Jefferson Township Fire Department experienced 1567 emergency runs, with 82.3% being EMS related. Also during 2013, there were 715 EMS transports to eight different hospitals. Only one of those hospitals lies within the same rural county as the Jefferson Township Fire Department. That hospital accounted for 65 transports or 9% of the total transports for the year. That hospital is 18 miles from the closest Columbus, Ohio metropolitan area hospital. The remaining transport hospitals are located in the metropolitan Columbus, Ohio area and they accounted for 651 transports or 91% of the total transports.

In the late 1980's, after hiring its first full-time firefighters, the Jefferson Township Fire Department failed one of its five year renewable levies. Wanting to establish a solid funding foundation for the fire department and knowing that they needed to increase their capabilities, the Jefferson Township Board of Trustees asked for community input through town hall meetings. This community input was the basis for moving from short-term renewable levies to a permanent levy that, based on projections, could be expected to adequately fund the fire department for 10 years. Early in the life span of the levy, the township collects a surplus that is used to cover the deficit in the later years. Since property tax levied income remains constant and operating expenses increase annually, there becomes a point where the budget no longer has an adequate surplus. It was understood that these permanent levies would need to be replaced with other permanent levies that would be based upon current property evaluations because Ohio Property tax law fails to adjust with population or property value increases. For the Jefferson Township Fire Department, that time period occurs every 10-11 years. Also, the State of Ohio has chosen to eliminate a tangible personal property tax levied against commercial facilities with no guarantee of a replacement funding mechanism. This equated to an income reduction of over \$220,000 or approximately 9% of Jefferson Township Fire Department's annual revenue.

Jefferson Township, Madison County (2013) shows that the Jefferson Township Fire Department's 2013 budget expenses totaled \$2,381,636. Of that amount, personnel costs accounted for \$1,749,617 or 73.4% of the budget. Revenue for the same time period was \$2,478,226.38, with \$2,003,448 or 80.8% based upon tax income and \$213,939 or 8.6% based upon income from EMS transport re-imburements. Jefferson Township contracts out the EMS billing services to a third party billing company. After conducting a review with the company it was determined that our average income received per transport had decreased slightly over the

last few years. That trend seemed to be normal as it was attributed to changes in Medicare and Medicaid as well as some procedures with health insurance companies. It was anticipated that with continual changes in Medicare and Medicaid, there would continue to be a decrease in income received from EMS transports.

The vast majority of Jefferson Township Fire Department's jurisdiction is agricultural with some commercial growth, which as previously mentioned, has been tax abated to entice businesses to move into the area. Because of the tax abatement, Jefferson Township Fire Department provides emergency services to these new businesses without receiving any income. 24% of Jefferson Township's population is of retirement age, many of which are on fixed incomes and since nearly 81% of Jefferson Township Fire Department's funding is based on taxes, increasing the tax burden would cause many of these people to do without some of life's essentials. In an attempt to lessen the burden on taxpayers and provide adequate services, Jefferson Township Fire Department makes every attempt possible to spend wisely, obtain donations or grant moneys, and identify additional potential funding mechanisms.

The fire department continually reviews expenses and revenue. The current levy cycle is right on track from what was projected but it is understood that in 5 years, it will not adequately fund the fire department and any carryover monies will be starting to be spent down.

Last year, it was proposed to the Township Board of Trustees that we investigate the benefits of implementing a Mobile Integrated Healthcare – Community Paramedicine (MIH-CP) program within the Jefferson Township Fire Department. However, it was determined that the Jefferson Township Fire Department would only start it if we thought it would be another source of revenue. I had been introduced to the concept of MIH-CP through the various organizations that I am a member. Throughout the nation, MIH-CP is becoming more prevalent, and has been

a hot topic at conferences and training sessions but there is limited information about the feasibility of agencies implementing it.

The potential impact that this study could have on the Jefferson Township Fire Department is to expand its current service delivery to include a MIH-CP program to fill health care needs that are missing within the community that the department serves and secure additional funding in hopes of extending the life of the tax levy.

LITERATURE REVIEW

The Rural and Frontier EMS Agenda for the Future (2004) defines MIH-CP as “an organized system of services, based on local need, which are provided by EMTs and paramedics integrated into the local or regional health care system and overseen by emergency and primary care physicians.” This not only addressed gaps in primary care services, but enables the presence of EMS personnel for emergency response in low call-volume areas by providing routine use of their clinical skills and additional financial support from these non-EMS activities. Zavadsky (2012) explains that in its simplest form, MIH-CP is meant to be an outreach to those patients at risk for using EMS or an in-patient healthcare system for what would be considered as primary care services and helping them find more appropriate, cost effective resources for their medical needs. The potential for various MIH-CP services is only limited by an EMS service’s desire and ability to fill the gaps within one’s community. A MIH-CP program is not intended to replace existing resources, instead it is meant to supplement them. U.S. Department of Health and Human Services (2012) explains that in rural areas, MIH-CP programs often concentrate on properly allocating limited health care resources and improving access to underserved areas while in urban areas, many of these programs have been designed at keeping the “frequent flyers” out of the emergency rooms by making sure their needs are met in other ways. Whether rural or urban, many of these programs take health care into the patient’s home.

Zavadsky and Hooten (2016) show that in 2011 the United States healthcare expenditures were \$8608 per person, which is more than two and a half times the average of other countries. Another issue is that even with those high expenditures, we are behind in most health statistics, including obesity, infant mortality and preventable diseases, such as diabetes. They go on to state that a primary reason for this is because the United States has a largely quantity-based

payment system where the healthcare providers are rewarded by the number of billable procedures they perform instead of them being given incentives to keep patients healthy and avoiding the need to use the healthcare system. Zavadsky (2012) states that “regardless of your position on the Affordable Care Act (ACA), its intent is to move the U.S. healthcare system away from one that provides financial incentives based on the quantity of services to incentives based on the outcomes of care.”

Public Law 111-148 (2010) also known as the Patient Protection and Affordable Care Act (PPACA) was signed into law on March 23, 2010. It represents some of the most aggressive changes to the financing of the U.S. healthcare system since Medicare. One provision of the PPACA is for MIH-CP, which is intended to help reduce the current burden on the United States healthcare system. The Institute for Healthcare Improvement (2007) had already developed the triple aim framework for making improvements to the healthcare system. The patient experience must be improved (including quality and satisfaction), the health of the population must be improved, and per capita costs must be reduced. The PPACA created the term Accountable Care Organizations (ACO) which is a group of doctors, hospitals, or any other healthcare providers that collectively voluntarily agree to administer high-quality care to Medicare patients. Since EMS agencies play a major part in pre-hospital care, where allowable, they can be part of the MIH-CP system in a community. The PPACA did not dictate exactly how MIH-CP would be accomplished or funded. Historically, for an EMS agency to receive funding for EMS services, it has been because they transport patients to institutions that provided a higher level of care. The PPACA was established to reduce the unnecessary burden of non-essential transports to emergency departments, but it did not create a specific funding mechanism for EMS agencies that provide pre-hospital services.

Gorman (2015) gives an example of a funding source through a federal grant for the Reno Emergency Medical Services to start up MIH-CP programs geared towards providing home visits, referring patients to services other than 9-1-1 and a nurse-run health line to utilize during non-emergent situations. Stevick (2014) describes another type of funding source in Snohomish County, Washington. A local hospital (ACO) funded the fire department for a period of two years to start up a MIH-CP geared towards regular home visits attempting to keep patients from unnecessarily calling 9-1-1 for transport to the emergency department. Coral Springs Fire Department in southern Florida has a self-funded program as shown in Huriash (2015). Their philosophy is that there is a value in providing a better service to their community and reducing the number of unnecessary 9-1-1 calls.

Tan (2013) writes that even though the basic concept of MIH-CP has been in existence in the United States for nearly 20 years, it has only recently become energized nationally through the passage of the PPACA in 2010. Locally, MIH-CP is even newer since Ohio did not allow EMT's to perform non-emergent MIH-CP activities until Ohio Revised Code 4765.361 (2015) was passed and went into effect on September, 30, 2015.

The National Association of Emergency Medical Technicians (NAEMT) collaborated with numerous national emergency medical services and emergency physicians' organizations to create a vision statement for MIH-CP. According to NAEMT's What is MIH-CP(2014), key components of MIH programs include:

- Fully integrated – a vital component of the existing healthcare system, with efficient bidirectional sharing of patient health information.
- Collaborative – predicated on meeting a defined need in a local community articulated by local stakeholders and supported by formal community health needs assessments.

- Supplemental – enhancing existing healthcare systems or resources, and filling the resource gaps within the local community.

- Data driven – data collected and analyzed to develop evidence-based performance measures, research and benchmarking opportunities.

- Patient-centered – incorporating a holistic approach focused on the improvement of patient outcomes.

- Recognized as the multidisciplinary practice of medicine – overseen by engaged physicians and other practitioners involved in the MIH program, as well as the patient’s primary care network/patient-centered medical home, using telemedicine technology when appropriate and feasible.

- Team based – integrating multiple providers, both clinical and non-clinical, in meeting the holistic needs of patients who are either enrolled in or referred to MIH programs.

- Educationally appropriate – including more specialized education of MIH-CP and other MIH providers, with the approval of regulators or local stakeholders.

- Consistent with the Institute for Healthcare Improvement's (IHI) Triple Aim philosophy of improving the patient experience of care; improving the health of populations; and reducing the per capita cost of healthcare.

- Financially sustainable – including proactive discussion and financial planning with federal payers, health systems, accountable care organizations, managed care organizations, physician hospital organizations, legislatures, and other stakeholders to establish MIH programs and component services as an element of the overall (IHI) Triple Aim approach.

- Legally compliant – through strong, legislated enablement of MIH component services and programs at the federal, state and local levels.

Practitioners providing the MIH-CP services may be paramedics, EMT's, nurses, nurse practitioners, physicians or even physician assistants.

Determining what services may be needed in a community should be a collaborative effort with community stakeholders that have knowledge about or a potential to have an impact on the health status of the community. Zavadsky and Hooten (2016) recommend the following:

- Medical director(s)
- Hospitals
- Administration
- Case management
- Social work
- Cardiologists
- Home health agencies
- Extended care/skilled nursing facilities
- Hospice agencies
- Internal workforce
- Emergency medical responders
- Healthcare system regulators
- Community based organizations (e.g., United Way, Meals on Wheels, shelters)
- Public health agencies
- Clinics (public and private)
- Educational institutions
- Behavioral health agencies
- Health science centers

- Pharmacies
- Third-party payers
- Public officials (elected and appointed)
- Community leaders
- Chambers of Commerce
- Media

Starting in October of 2014, the NAEMT conducted a comprehensive survey of the nation's MIH-CP programs. The NAEMT's Mobile Integrated Healthcare and Community Paramedicine (MIH-CP) National Survey(2015) was able to utilize information from 103 unique MIH-CP programs. 75% of the respondents reported having readmission avoidance programs, 74% reported having frequent users programs, 71% reported having chronic disease management programs, 52% reported having assessment & navigation to alternate destinations programs, and 44% reported having primary care/physician extender programs. Those were the top five types of MIH-CP programs in existence.

To properly conduct a cost-benefit analysis, we need to understand exactly what that means. According to Sewell and Marczak (1998), the basic questions asked in a cost-benefit analysis are, "Do the economic benefits of providing this service (MIH-CP), outweigh the economic costs" and "Is it worth doing at all?" They go on to summarize that the goal behind a cost-benefit analysis is relatively simple; if all inputs and outcomes of the project can be reduced to a common unit of impact (dollars), they can be aggregated and compared. Pearson, Gale, and Shaler (2014) determined that the necessary data to be collected in order to perform a cost benefit analysis will depend upon the service type provided and whether or not the MIH-CP program is affiliated with a hospital system, which will provide a more stable funding

mechanism. The NAEMT's Mobile Integrated Healthcare and Community Paramedicine (MIH-CP) National Survey(2015) identified the hospitals were the primary means of financial support for the MIH-CP programs as 40% of the programs reported that hospitals accounted for direct or supplemental financial support. Zavadsky, Staffan, and Swayze (2015) state that outcome measures should include changes in healthcare utilization (which drives the cost of care), patient health status and patient experience measures. Out of the 99 respondents in the NAEMT's Mobile Integrated Healthcare and Community Paramedicine (MIH-CP) National Survey(2015) that answered revenue questions,36% reported that their program generated revenue. In a separate question, 34% stated that they felt their MIH-CP program was financially stable and another 41% were neutral on the question. It was noted that a program's goal should be to direct patients to the most appropriate, convenient and least costly type of healthcare or social services provider qualified to take care of their needs. The majority of the respondents rated their programs as a success in showing a cost savings for their patients in two specific areas, by reducing 9-1-1 utilization and by reducing reliance on emergency departments. The survey did state that defining a successful MIH-CP program could be considered from multiple angles. Success can be defined by analyzing the data collected to determine impact and costs based upon the clinical outcomes. Success can also be defined by the EMS agency's relationships within its community and its ability to achieve the mission of serving the community. Finally, success can be looked at on a larger level, as in to what extent can MIH-CP improve patient outcomes and achieve sustainability on a nationwide scale.

Funding will be an important factor in the feasibility of a MIH-CP program. It is possible that nation-wide changes will be made to Medicare to allow for payments to MIH-CP providers that treat patients but do not transport them. According to Erich (2013), in 2012 Minnesota

passed legislation that established reimbursement for MIH-CP activities through the state's Medicaid program. As shown previously in Gorman (2015), funding can potentially be obtained from federal, state or local grants or from third-party payers such as hospitals (ACO's). Through Public Law 111-148 (2010), there is an advantage for hospitals to not have patients return within 30 days of being discharged, so some have established a partnership with local MIH-CP programs to provide follow up of their discharged patients as described in Stevick (2014).

The Literature Review clearly shows that in order to implement a MIH-CP program, key community leaders will need to be involved along with the fire department, its Medical Director and governing body. The community leaders can help determine what, if any, healthcare services are missing and also if the fire department has the capability to fulfill those missing gaps. They may also help secure a local funding mechanism. Our nation's current EMS model is outdated and in order to better help patients and reduce our nation's healthcare costs, it will need to be changed. Now that Ohio law has opened the door for MIH-CP, it is time to learn from best practices. Programs in other states have shown cost efficiency, better utilization of medical resources, and better patient outcomes.

PROCEDURES

Research

The extensive literature review targeted magazines, text books, trade journals, federal law, Ohio law, and the internet. The first phase of the literature review was directed towards researching what MIH-CP was and why there was a need. By examining healthcare costs throughout the world, it became apparent that there is a need for changes in the United States healthcare system. It was identified that the United States spends over two and a half times the average of all other countries on healthcare, but does not see any additional benefits over other countries that spend much less, including no increase in life expectancy.

A survey was developed in an attempt to gather information from current rural fire-based EMS agencies that had MIH-CP programs. At the time, since MIH-CP was not permissible in Ohio, the survey would need to be distributed to other states that allowed MIH-CP. A person was identified through the NAEMT that was subject matter expert and frequently distributed emails on MIH-CP. His email list included people that were either conducting MIH-CP or were interested in conducting MIH-CP and it was nationwide. The survey was distributed nationwide but was too narrowly focused on the rural component so as to target similar sized fire-based EMS agencies such as the Jefferson Township Fire Department and because of that, there was only one agency that was able to complete the survey. This was a limiting factor to obtaining useful data. A summary of a comprehensive MIH-CP survey that had been conducted by the NAEMT was utilized to provide information on the most common programs in existence along with some funding information. Even though it identified 33 states with MIH-CP programs, the majority of the respondents classified their communities as either urban or suburban compared to rural or super rural, so between the two surveys, it was determined that very few rural fire-based

EMS agencies were performing MIH-CP. The NAEMT survey included vague information pertaining to program costs such as staffing and training along with some potential funding sources. It also discussed multiple ways to determine a MIH-CP program's success, which is not always financially based. This information would help to conduct a cost-benefit analysis to assist with the determination of the feasibility of starting a MIH-CP program within the Jefferson Township Fire Department.

Determining Needed Services

The second phase of the study focused on how to determine what, if any services were needed within our service area. Based upon Zavadsky and Hooton (2016), it was determined that we would need to involve community stakeholders to define what services were missing in our community and then determine if we could provide them. Based on the suggested list of community stakeholders, Jefferson Township Fire Department contacted the following stakeholders and they have expressed an interest providing at least one representative to participate in the community health needs assessment meetings: Madison County Health Department, Madison Health Partners, Madison County Jobs and Family Services Agency, Madison County Emergency Management Agency's Crisis Response Team, Madison County Board of Developmental Disabilities, local chapter of the American Red Cross, Madison County Free Clinic, Madison County Sheriff's Department, Loving Care Hospice/Home Health, Madison County Mental Health Services, Arbors West Nursing Home, Arbors of London Nursing Home, Madison County Senior Center, Madison County Diabetes Association, Jefferson Local School District, Madison County Meals on Wheels, West Jefferson Community Association, Madison County Commissioners, West Jefferson Village Council, Jefferson Township Trustees, West Jefferson Police Department, Madison County Chamber of Commerce,

The Madison Press, CVS Pharmacy, Kroger Pharmacy, and the Wal-Mart Pharmacy. There will also be administrators and other members of the Jefferson Township Fire Department.

There have also been some discussions about joining efforts with other EMS providers in Madison County, particularly the one located in London which houses the community hospital and most of the county offices. We agree that since we are a rural county, there is no need to duplicate efforts and in fact, it might be easier to gain support, including financial, if we worked collaboratively as a larger regional group.

Cost-Benefit Analysis

Once the needed services are identified, Jefferson Township Fire Department has completed research in order to complete a cost-benefit analysis on the feasibility of implementing a MIH-CP program. The cost-benefit analysis will compare the costs of providing the needed services, such as personnel and equipment to the benefits to the community. As shown in the research the benefits may be harder to quantify initially since the health of the community is a long term investment.

Limitations of the Study

As there were no agencies formally performing MIH-CP programs in Ohio, a survey was conducted trying to reach similar sized fire-based EMS agencies throughout the nation. The National Association of Emergency Medical Technicians attempted to help identify those agencies by sending out the survey to a MIH-CP email group that reached hundreds of members. There has been an increased interest to develop MIH-CP programs throughout the nation, but up to this point, rural fire-based EMS agencies that provide MIH-CP programs are virtually non-existent, most are either urban or suburban. This was a severe limitation for this research project because it did not allow data to be collected from similar types of jurisdictions. Also, the survey

was intended to help collect data to assist with the cost-benefit analysis by reviewing results of existing programs. This could not be accomplished because not enough data could be gathered. Only eight survey responses were attempted and only one could be completed because it was a rural fire-based EMS agency that was performing MIH-CP activities. Some information was gathered from a summary on a nationwide survey on MIH-CP that was conducted by the NAEMT in 2014 but they refused to provide the survey or any of its raw data. Information into the feasibility of MIH-CP would need to be centered on assumptions and information from programs in other states. It is not ideal but information can be gathered from these other programs. Any MIH-CP programs will have to be constantly monitored and updated on a regular basis. The NAEMT survey highlighted successful MIH-CP programs in Minnesota, North Carolina, Texas, and Colorado. Additionally, Zavadsky and Hooten (2016) discussed successful programs in Nevada, Pennsylvania, Oregon, and Illinois. Based on varying criteria, there are successful MIH-CP programs in other states and now that Ohio allows MIH-CP, it is anticipated that successful MIH-CP programs can be established in Ohio as well.

Definition of Terms

EMS. Emergency medical service.

EMT. Emergency Medical Technician.

IHI. Institute for Healthcare Improvement.

MIH-CP. Mobile Integrated Healthcare – Community Paramedicine.

NAEMT. National Association of Emergency Medical Technicians.

PPACA. Patient Protection and Affordable Care Act. Sometimes referred to as the ACA or Affordable Care Act.

RESULTS

The first research question asked: What is Mobile Integrated Healthcare-Community Paramedicine? This was answered by The Rural and Frontier EMS Agenda for the Future (2004) which defines MIH-CP as “an organized system of services, based on local need, which are provided by EMTs and paramedics integrated into the local or regional health care system and overseen by emergency and primary care physicians.” Zavadsky and Hooten (2016) show that based on our nation’s healthcare system, there is clearly a need for MIH-CP programs.

The second research question asked: How do we determine what, if any services are needed in our community? Zavadsky and Hooten (2016) described the potential list of stakeholders that should be gathered to identify missing healthcare needs in the community. The Jefferson Township Fire Department determined that many key stakeholders existed in their service area and has initiated conversations, building relationships and garnering support to pull the necessary stakeholders together to conduct a community needs assessment. Any type of health services along with many public service agencies were contact and also asked if they could identify other appropriate agencies to involve. There was a focus on the community serviced by the Jefferson Township Fire Department, but county-based agencies were also contacted because they provide services within the local community. The following agencies have expressed an interest in involving a representative: Madison County Health Department, Madison Health Partners, Madison County Jobs and Family Services Agency, Madison County Emergency Management Agency’s Crisis Response Team, Madison County Board of Developmental Disabilities, local chapter of the American Red Cross, Madison County Free Clinic, Madison County Sheriff’s Department, Loving Care Hospice/Home Health, Madison County Mental Health Services, Arbors West Nursing Home, Arbors of London Nursing Home,

Madison County Senior Center, Madison County Diabetes Association, Jefferson Local School District, Madison County Meals on Wheels, West Jefferson Community Association, Madison County Commissioners, West Jefferson Village Council, Jefferson Township Trustees, West Jefferson Police Department, Madison County Chamber of Commerce, The Madison Press, CVS Pharmacy, Kroger Pharmacy, and the Wal-Mart Pharmacy along with administrators and other members of the Jefferson Township Fire Department.

There was also some discussion about collaborative efforts with other mutual aid EMS partners since we are smaller county. Individualized primary conversations have identified at least four healthcare areas that may be lacking in the community: assessment/navigation to alternate appropriate destinations, readmission avoidance, chronic disease management, and frequent 9-1-1 users. These areas are within the top five types of MIH-CP programs identified throughout the nation by the NAEMT MIH-CP survey that was conducted in 2015. By gathering these stakeholders together, the group can collectively decide if those services are indeed lacking, along with any others, then determine if the Jefferson Township Fire Department can address them through a MIH-CP program. This will be a slow process to properly complete as the concept of MIH-CP is relatively new to our region. Not only do we need to build some relationships with the stakeholders that did not previously exist, but we also need to build trust in that we are not trying to duplicate or replace services that are already in place, we are merely trying to fill gaps in services that are needed.

The third research question asked: What are the most common Mobile Integrated Healthcare-Community Paramedicine Programs in existence? The NAEMT's Mobile Integrated Healthcare and Community Paramedicine (MIH-CP) National Survey(2015) was able to identify

the five most common programs and along with Zavadsky and Hooten (2016), help to define them:

- Readmission avoidance programs – nearly 20 percent of traditional Medicare patients who are discharged from hospitals are re-hospitalized within 30 days. Those discharged with serious conditions are followed-up with to make sure they understand and are following discharge orders, medicine is being taken properly, they have necessary medical equipment, and that home health is being received.
- Frequent users programs – about 33 percent of emergency room visits are classified as non-urgent or semi-urgent. These people can place a strain on emergency services unnecessarily and represent care that could have been provided more safely and efficiently in other settings, including the home. Educational services provided include medication compliance, healthy lifestyle changes, nutrition support, home environment/safety needs, behavioral health support, when to call for an appointment, how to call for an appointment, important information to share with providers, and how to utilize various transportation services.
- Chronic disease management programs – similar to the readmission avoidance programs, those with chronic diseases are regularly followed-up with to make sure they are following care orders, that they have the proper medicines and are taking them correctly, they have necessary medical equipment, and that home health is being received.
- Assessment & navigation to alternate destinations programs – the majority of MIH-CP patients are referred to home health organizations but some may be referred to other service organizations that they were unaware of but, can meet their needs. This

can include a 24/7 assessment health line and alternate care pathways can involve transport directly to a mental health facility for psychiatric patients, transport of inebriated patients directly to a detoxification facility and transport of 9-1-1 patients with low acuity conditions to clinics and urgent care centers.

- Primary care/physician extender programs – many times in rural, low income, or primarily elderly communities they are lacking in primary care physicians. These programs can provide regular medical care that is otherwise missing, such as checking wounds, conducting examinations, checking medicines, and evaluating a patient’s overall health then following up with the primary care physician reporting any changes or concerns as necessary.

The fourth question asked: How do we determine the cost-benefit analysis of implementing a Mobile Integrated Healthcare-Community Paramedicine program in the Jefferson Township Fire Department? Sewell and Marczak (1998) state that a cost-benefit analysis compares the monetary costs and benefits of program. Simply, is the revenue greater than the expenses? They suggest that the goal of a cost-benefit analysis is simple; if all inputs and outcomes of the project can be reduced to a common unit of impact (dollars), they can be aggregated and compared. Then a determination can be made. But, a potential MIH-CP program needs to consider the value of providing a missing healthcare service to their residents also. The NAEMT’s Mobile Integrated Healthcare and Community Paramedicine (MIH-CP) National Survey (2015) identified that on 36 of the respondents reported that their MIH-CP programs generated revenue. Of those 36 that responded to the question, annually seven receive under \$10,000, four receive between \$10,001 and \$25,000, one receives between \$25,001 and \$50,000, four receive between \$50,001 and \$100,000, two receive between \$100,001 and

\$150,000, two receive between \$300,000 and \$500,000 and two receive more than \$500,000. 34 percent considered their programs financially sustainable, while 41 percent were neutral, 20 percent disagreed and four percent did not know. Annual operating costs were reported by two percent to be \$0, 16 percent reported between \$1 and \$10,000, 16 percent reported between \$10,001 and \$25,000, five percent reported between \$25,001 and \$50,000, 12 percent reported between \$50,001 and \$100,000, 11 percent reported between \$100,001 and \$150,000, 13 percent reported between \$150,001 and \$300,000, 11 percent reported over \$300,000 and 13 percent did not know.

The unknown element is if there will be additional training required by the agency's Medical Director or Physician Advisory Board. Of those MIH-CP programs that responded to the NAEMT's 2015 survey, nearly all reported some type of additional training provided for their MIH-CP practitioners. The top training categories were clinical topics (67 percent), patient relations/communications (66 percent), accessing community programs and social services (63 percent) and patient navigation (59 percent). The length of training varied amongst the programs. 43 percent reported less than 40 hours, 18 percent reported 40-80 hours, 18 percent reported 80-120 hours, 11 percent reported 120-140 hours, four percent reported more than 240 hours and six percent were unknown. Along with the classroom hours, many of the respondents reported required clinical rotations/field training. 49 percent reported less than 40 hours, 16 percent reported 40-80 hours, 10 percent reported 80-120 hours, 16 percent reported 120-140 hours, four percent reported more than 240 hours and six percent didn't know. Obviously classroom and clinical hours vary widely throughout the existing MIH-CP programs that completed the NAEMT survey. That information will be an important factor when performing a cost-benefit analysis for a potential MIH-CP program.

Prior to June 2015, state legislation simply did not allow for MIH-CP activities in Ohio because the Ohio Administrative Code 4765-17-03 (2013) dictates the scope of practice for EMT's. It describes their ability to perform emergency medical services and it is understood that there is an expectation of transporting patients to medical facilities. On June 30, 2015, Ohio Governor John Kasich signed into law House Bill 64 (HB 64) which was the biennial budget bill. Ohio Revised Code 4765.361 (2015) now allows an emergency medical technician-basic, emergency medical technician-intermediate, or emergency medical technician-paramedic to perform medical services that the technician is authorized by law to perform in nonemergency situations if the services are performed under the direction of the technician's medical director or cooperating physician advisory board. In nonemergency situations, no medical director or cooperating physician advisory board shall delegate, instruct, or otherwise authorize a technician to perform any medical service that the technician is not authorized by law to perform. Instead of dictating certifications and/or training requirements, it was the intention of those working on the legislation that those decisions would be made locally by the Medical Director overseeing the MIH-CP program.

The other important factor will be establishing a stable funding mechanism for a potential MIH-CP program. It is possible that this could be identified through the collaboration of the stakeholders that were gathered to determine any healthcare gaps in the community. In the NAEMT's 2015 survey 15 percent of the respondents reported direct financial support or payment of services from hospitals, five percent from hospice, four percent from public health agencies, four percent from nursing homes, and two percent from physician groups. Other means of financial support such assistance with staffing, supplies or other resources, and oversight and directions were reported as 25 percent from hospitals, five percent from physician

groups, five percent from primary care facilities, four percent from home health organizations, and three percent from mental health facilities. Nationwide reimbursement reform would make the funding question easier to answer for those wanting to establish a MIH-CP program.

DISCUSSION

MIH-CP goes back many years but seems to be just now taking hold throughout the nation. Programs have been implemented in Australia, Nova Scotia and Canada that were shown to be successful in reducing healthcare costs and also improve patient care. Within the United States, 33 states were identified as having MIH-CP programs and successful programs were specifically identified in Washington, Minnesota, North Carolina, Texas, Colorado, Nevada, Pennsylvania, Oregon, Florida and Illinois. Even though the Patient Protection and Affordable Care Act has sparked an increasing desire for MIH-CP programs to become an integral piece of our nation's healthcare system, very few programs exist in fire-based EMS agencies up to this point. I recognized that MIH-CP was relatively new in the United States, but I did not expect to have such a difficult time gathering the necessary information to complete this research.

Ohio can now join other states throughout our nation that have made necessary legislative changes to allow the implementation of MIH-CP programs. Not all states that have MIH-CP programs required legislative changes because it was determined that their EMT scope of practice permitted them to perform MIH-CP activities. Since Ohio did not allow MIH-CP before September of 2015, I had to identify a person that is considered a national subject matter expert in MIH-CP help me by sending out a survey to large nation-wide group of people interested or participating in MIH-CP programs. That survey was too narrowly focused on rural fire-based EMS agencies that provide MIH-CP, but because there aren't many in existence, information could not be collected. In fact, there was only one agency that fit the criteria to complete the survey. After restructuring my survey so it wasn't so narrowly focused, I wanted to resend it but lost contact with the MIH-CP professional that had access to the nationwide email list. I then had to conduct more research and found a summary article about a survey that the NAEMT

conducted in 2015 that provided much of the necessary information I needed to answer my research questions. After contacting the NAEMT, they refused to give me the survey questions and any raw data.

I ended up feeling that this research project was probably a year too early. It is an increasingly changing topic and as time goes on, more agencies will be implementing MIH-CP so it will be easier to gather the information needed to conduct a cost-benefit analysis. I am aware of at two MIH-CP programs that have started Ohio. One programs with a fire-based EMS agency that is working directly with a retirement community to provide routine healthcare visits to specific elderly patients. It is a trial program that is funded through the normal fire department budget while they are working to establish some partnerships for potential long-term funding. This program needed very limited additional training because the fire department staff consisted of multiple registered nurses that are participating in the program along with providing some oversight. The other program is with a group of fire-based EMS agencies working directly with a local hospital to provide on-going healthcare to specific previous hospital patients with congestive heart failure problems. This program is funded through a grant from the local hospital while the agencies conduct their program on a trial basis. This program sent three staff members that were selected to participate in the program to a 40-hour MIH-CP training course, which was funded through the grant.

Another aspect of MIH-CP that I was interested in researching pertained specifically to emergency response agencies. I was interested in learning if anybody identified that MIH-CP hindered emergency operations. I don't believe that to be the case because even though response personnel may be utilized for the MIH-CP activities, the activities are non-emergent so if there

was an actual emergency, the personnel could respond and complete the MIH-CP activities afterwards.

RECOMMENDATIONS

It was the intent of this applied research project to determine if there was a community need for MIH-CP and the feasibility of the Jefferson Township Fire Department implementing program. The Jefferson Township Fire Department will need to continue to conduct research and gather more information before making that determination. As time goes on, more MIH-CP programs will be implemented so it should become increasingly easier to gather valuable information from them. There are programs that have started in Ohio with two fire-based EMS agencies, so in a year's time there will be more information available on those MIH-CP program's income and expenses. Once a determination is made locally if there is a healthcare need for MIH-CP, medical director(s) overseeing the program will have to make the determination as to whether or not additional training will be required. That information will be necessary to conduct a cost-benefit analysis. Future surveys should inquire more specifically about expenses incurred due to MIH-CP activities. The other key component to a cost-benefit analysis is funding. The Jefferson Township Fire Department has seen a slight reduction in income from EMS patient transports, so it would be beneficial for them to secure funding to provide any necessary MIH-CP activities. Other programs have shown funding models that include grants and partnerships with third party payers. Nationwide Medicare/Medicaid reimbursement reform that will cover MIH-CP activities is being worked on but most likely will initially be focused on primary care physicians before filtering to EMS agencies.

Many of the residents that the Jefferson Township Fire Department provide services for are elderly and on fixed incomes and since the area is mainly agricultural, they are without an abundance of close medical resources. JTFD has initiated conversations with community healthcare stakeholders in an attempt to build relationships and get support to conduct a

healthcare service gap analysis. Initial conversations have informally identified some common gaps that are similar to those seen throughout the country: assessment/navigation to alternate appropriate destinations, readmission avoidance, chronic disease management, and frequent 9-1-1 users, so it is likely that there are some healthcare needs of the community that are not being met adequately. If it is concluded that there are gaps, the next question the stakeholders will have to answer is whether or not JTFD can provide those services. This has been a slow process with numerous conversations because the concept of MIH-CP is so new and there is much needed education on the concept, but if done correctly, that also helps to build trust and foster the necessary relationships.

It has been proven in other parts of the world, including within our nation that MIH-CP can be successful, so based upon the limited comparable information currently available, if a program is thoroughly researched ahead of time a determination should be able to be made as to its feasibility. It will be important to start out any MIH-CP program on a small scale, continually track expenses, income, patient outcomes and make necessary changes when needed to help facilitate a program's success. Enough initial information was obtained through this research to recommend the Jefferson Township Fire Department continue the process of investigating MIH-CP more thoroughly.

In 2016, the Ohio Fire Chiefs' Association is working to form a MIH-CP committee. Initially, their goal will be to create a template to assist an agency to when determining if there are MIH-CP needs in their community and if they have the ability to provide the services. They hope to get representation from those Ohio programs that have started up to be able to provide common best practices based upon the existing program's experiences.

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