

Principles for Establishing a Mobile Integrated Healthcare Practice



Filling the gaps in healthcare to improve outcomes, patient satisfaction and value

About This Guide



Mobile Integrated Healthcare Practice (MIHP) is a novel healthcare delivery platform intended to serve a range of patients in the out-of-hospital setting by providing patient-centered, team-based care using mobile resources.

Medtronic Philanthropy's mission is to expand access to care for underserved populations worldwide. Medtronic sees the practice of Mobile Integrated Healthcare as an important step in filling the existing gaps in healthcare and fulfilling our mission.

Medtronic Philanthropy appreciates the work of the Mobile Integrated Healthcare Practice Collaborative in producing this document. Written by leading researchers, educators, medical directors and practitioners, this guide pulls together and places in context the basic tenets that should be a part of every Mobile Integrated Healthcare Practice.



Medtronic, Inc. (medtronic.com), headquartered in Minneapolis, is the global leader in medical technology—alleviating pain, restoring health and extending life for millions of people around the world. Medtronic Philanthropy focuses on expanding access to quality chronic disease care among underserved populations worldwide, in addition to supporting health initiatives in communities where Medtronic employees live and give.

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Introduction

Critics of the U.S. healthcare system often point out that, despite skyrocketing costs for patients, payers and society overall, health outcomes in this country remain less than optimal.¹ Frequently cited healthcare failures include lack of access to care for many patients; billions of dollars wasted due to inefficient delivery models and excessive administrative costs; inadequate efforts to prevent illness and disease; fragmentation of acute and chronic care; and outdated and complex reimbursement plans.

The fragmentation and inefficiencies of healthcare services in the United States are notably evident in the care of patients outside of the hospital setting; this is particularly true for the chronically ill, the elderly and the mobility-impaired. Multiple providers offer only niche care (and often only during certain hours), which does not match the actual needs of these patient populations.

As a result, patients who require care outside of normal business hours are routinely referred to the emergency department (ED), even when it is clear that the ED is not the most appropriate place for them to receive care. Furthermore, care gaps, such as a lack of post-acute transitional care, make preventable readmissions a virtual inevitability—one that is both undesirable and expensive for patients, their caregivers and the healthcare system.

Mobile Integrated Healthcare Practice: a delivery strategy for interprofessional medicine

Mobile Integrated Healthcare Practice (MIHP) offers a strategy for correcting some of these shortcomings. In its simplest form, MIHP is a novel healthcare delivery platform intended to serve a range of patients in the out-of-hospital setting by providing patient-centered, team-based care using mobile resources.

This healthcare practice accomplishes these goals

by emphasizing the importance of providing the right care, at the right time, in the right location and at the right cost.

In order for MIHP programs to succeed, all three elements of the Triple Aim must be addressed. The programs also must be designed to be scalable and sustainable. MIHP programs can achieve these objectives by engaging and integrating existing infrastructure and resources, incorporating inter-professional expertise and leadership, and developing sustainable financial frameworks based on a value-based population health model.

MIHP is designed to achieve the goals of the Institute for Healthcare Improvement's Triple Aim^{2,3}:

- Improve the health of the population
- Enhance the patient experience of care, including quality, access and reliability
- Reduce or control the per-capita cost of care

MIHP programs will vary from community to community based on specific needs and available resources. However, a unified strategy and framework will make aspects of these programs easier to reproduce and allow for evaluation of their impact on patients, communities, population health and the healthcare system.

Features of a comprehensive and accountable MIHP program

Ideally, MIHP is a restructuring of existing healthcare resources, not a new means to increase healthcare spending. Indeed, programs that operate only as "additions" to the current healthcare infrastructure have demonstrated a consistent inability

INTRODUCTION

to establish economic sustainability. In contrast, an MIHP strategy is designed to support and augment other patient-centered delivery models—including the patient-centered medical home, the chronic care model and the accountable care organiza-

MIHP programs must retain a patient-centered focus with an emphasis on accessibility, development of non-traditional portals of entry, continuity of care and transparency.

tion—by providing an optimized mix of healthcare and patient navigation at a lower cost than traditional models. MIHP may find funding within one of those four models as a cost-optimization strategy that is based on shared savings. However, while financial sustainability is critical, MIHP programs must retain a patient-centered focus with an emphasis on accessibility, development of non-traditional portals of entry, continuity of care and transparency.

Comprehensive and accountable MIHP programs will include many of the following features:

- Program and healthcare outcome goals informed by a population health needs assessment
- Patient access through a patient-centered mobile infrastructure
- Delivery of evidence-based interventions using multidisciplinary and interprofessional teams composed of providers operating at the top of their respective scopes of practice
- Improved access to healthcare and health equity through 24-hour availability
- Patient-centered healthcare navigation and

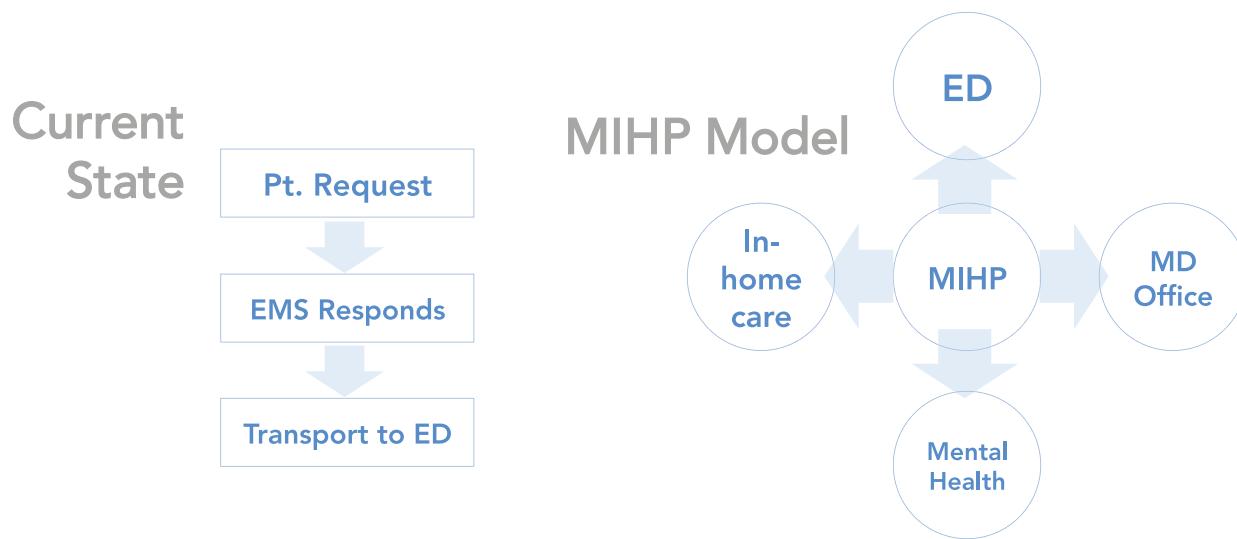
population-specific healthcare services

- Full utilization of existing infrastructure and resources, including telemedicine technology
- Integrated electronic health records and access to health information exchanges
- Provider education and training based on assessments of program needs and provider competencies
- Physician medical oversight in program design, implementation and evaluation
- Strategic partnerships engaging a spectrum of healthcare providers and other key stakeholders
- Financial sustainability
- Quality outcomes performance measurement and program evaluation

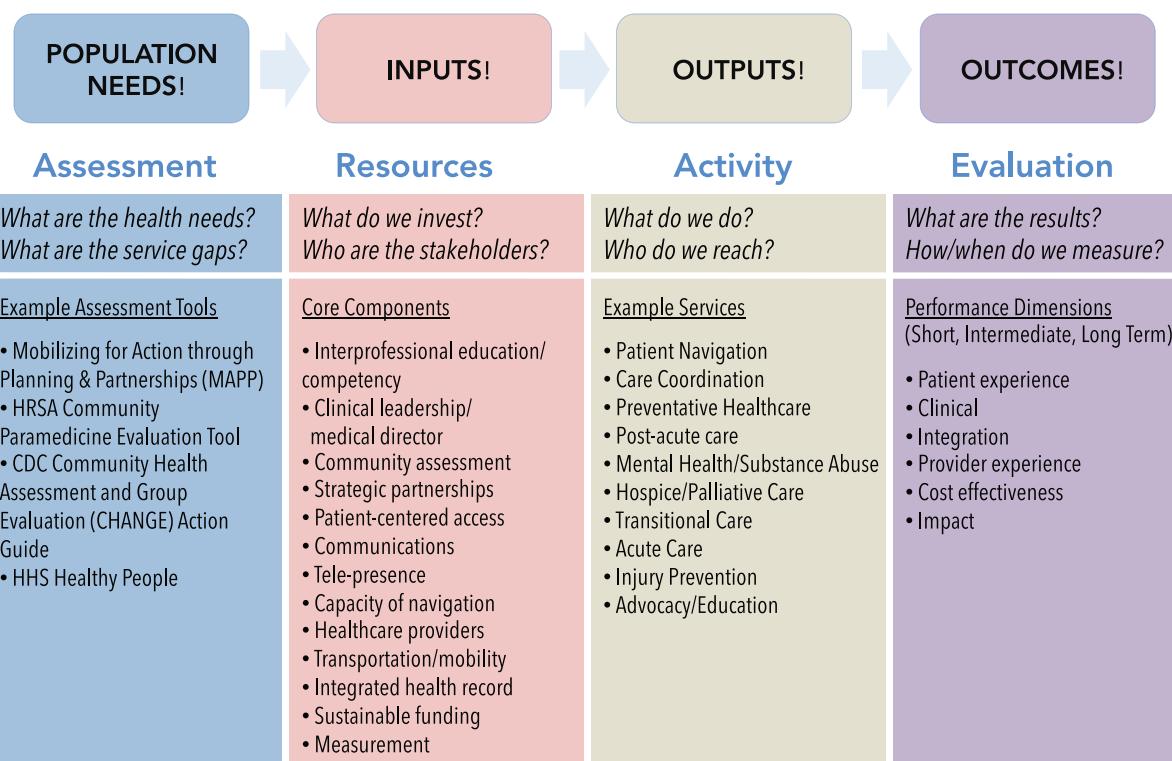
MIHP programs that rely on a single type of provider or healthcare entity—and are thus not fully engaged with a patient’s other healthcare and social service needs—will be too limited in their scope and capacity to efficiently use healthcare resources, and are thus unlikely to achieve either financial sustainability or better healthcare for patients. By contrast, interprofessional collaboration and multi-stakeholder partnerships—defined by local needs and resources—will set MIHP apart from previous mobile healthcare efforts, and will allow MIHP programs to break down the healthcare silos that often result in the uncoordinated, expensive and ineffective healthcare that we see today.

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MIHP Logical Model



CHANGING THE PARADIGM

These figures are reproduced from a scientific poster presented by Eric Beck, DO, at the November 2013 annual meeting of the American Public Health Association. Mobile Integrated Healthcare Practice challenges the current system of care and offers a novel approach to integrating services from multiple disciplines.

CHAPTER 1

Population Health Needs Assessment

Introduction

Mobile Integrated Healthcare Practice (MIHP) provides a framework for collaborative efforts between diverse sets of healthcare professionals and services. MIHP programs that seek to compete, rather than collaborate, with existing healthcare services will thus encounter a difficult path to success. Indeed, an MIHP program should be carefully targeted to address an existing gap in service or an emerging healthcare need. Specifically, an MIHP program should provide a service or connection that currently does not exist in a particular community or for a specific population.

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A population health needs assessment is critical to identifying gaps and unmet needs in a community's healthcare system. Accordingly, it is an important first step in any MIHP project. While many similar healthcare problems can be found in communities across the country, subtle (and not-so-subtle) differences do exist between the needs of different

communities. Geography, demographics, economics, politics and culture of communities can all impact which resources are available, which are needed and which can be provided by an MIHP program.

What is a population health needs assessment?

A population health needs assessment is a systematic and comprehensive method of examining the current status of a population in order to determine what outcomes must be achieved.⁴ Once the relevant outcomes have been identified, programs can then be developed specifically around them. A successful MIHP needs assessment will incorporate tools from epidemiology, economics and health policy; it will also include the perspectives of communities, healthcare providers and patients. Needs assessments can range in size and scope but should always use all available information, both quantitative and qualitative, to ensure that decisions are made based on facts rather than assumptions.

Traditionally, population health needs assessments have been the realm of public health professionals. Local and state health departments often produce population health needs assessments that focus on major health issues for an entire community. More recently, however, population health needs assessments have also become commonplace among other healthcare organizations. The Affordable Care Act, for example, requires hospitals with 501(c)(3) status to conduct population health needs assessments every three years. Many community health centers, hospice agencies, patient-centered

medical homes and large employers are also now conducting population health needs assessments.

Why conduct an MIHP population health needs assessment?

Conducting a needs assessment prior to developing an MIHP program promotes greater sustainability and acceptance of the program. An MIHP program that simply replicates the model of programs in other communities might find that its services are not needed, that it competes with existing programs or that the community does not want the program. For example, a population health needs assessment may spur one community to develop an MIHP program to divert substance abusers who are not in need of emergency medical care away from the ED by transporting them directly to detoxification centers. Another community may try to replicate this program, only to find that substance abusers make up such a small percentage of ED volume that the program is neither necessary nor sustainable.

A population health needs assessment is the best method for determining what health outcomes are desired but not being achieved in a particular community, how to prioritize those needs and what resources are necessary in order to achieve them.

The process of conducting a population health needs assessment can also provide a good foundation for the implementation of the MIHP programs that ensue. A thorough population health needs assessment requires interacting with, and gathering information from, several different community stakeholders that are likely to play an important role in the establishment of any MIHP program. They include healthcare organizations such as public health departments and hospitals, individual healthcare providers, public and private social service agencies, and other relevant groups and individuals. A population health needs assess-

ment can also inform the development of performance measures and targets, which are critical pieces of any community health program.

How does one conduct a population health needs assessment?

A population health needs assessment can be broad, encompassing an entire community or region; or it can be narrow, focusing on a specific sub-population within a community. For many organizations involved in MIHP, the first step in conducting a population health needs assessment will be to choose the relevant population. Sometimes, that choice will be easy—an insurer, for example,

Conducting a needs assessment prior to developing an MIHP program promotes greater sustainability and acceptance of the program.

may conduct an assessment of the needs of its own members or beneficiaries. Similarly, a hospital might focus on patients with a specific diagnosis that is prone to readmission, such as congestive heart failure. And an EMS agency might choose to look at its most frequent 911 callers.

Ideally, population health needs assessments should be conducted in collaboration with local health organizations, community leaders, academic institutions, and other community stakeholders with pertinent expertise and experience. Developing new partnerships with community stakeholders will be critical when producing a truly comprehensive population health needs assessment. Relevant stakeholders will include healthcare payers,

accountable care organizations, home health providers, hospice agencies, public health departments, social service providers, hospitals, EMS systems, community groups and patients.

A population health needs assessment should be informed by quantitative data as well as qualitative

A successful MIHP needs assessment will incorporate tools from epidemiology, economics and health policy; it will also include the perspectives of communities, healthcare providers and patients.

information. Epidemiological and demographic information, if available, will be a key resource. Gaps in services may also be identified through surveys, discussions with stakeholders and the use of other information sources. Some resources that may be relevant to a population health needs assessment include the following:

- Previous community health assessments and reports
- Existing data (e.g., local health department statistics or CMS data)
- Literature reviews
- Surveys
- Focus groups
- Interviews
- Expert panels
- Case studies
- GIS (geographic information systems) mapping
- Community forums

In addition to identifying gaps and unmet needs in existing healthcare services, a population health needs assessment can help identify potential resources and partners for an MIHP program. The population health needs assessment may also help an MIHP program prioritize its efforts, particularly when it uncovers several gaps in care that cannot be addressed simultaneously. If this is the case, the needs assessment should be used to assist with determining the scope of each problem, identifying the consequences of not addressing any particular problem, calculating the costs associated with both the status quo and potential solutions, and weighing other factors that will be critical in setting program priorities.

There is no one-size-fits-all approach to performing a population health needs assessment. Conducting such an assessment in the context of MIHP will require the incorporation and local adaptation of many different tools, techniques and approaches. The Association of Community Health Improvement, in partnership with the American Hospital Association, recommends a six-step framework for needs assessment and program planning that may be useful for MIHP programs:⁵

1. Establishing the Assessment Infrastructure
2. Defining the Purpose and Scope
3. Collecting and Analyzing Data
4. Selecting Priorities
5. Documenting and Communicating Results
6. Planning for Action and Monitoring Progress

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Questions to Ask as Part of a Population Health Needs Assessment

GENERAL QUESTIONS

- What is the target population?
- What is the goal?
- Who are the relevant stakeholders?
- What can be changed?
- What are the barriers to change?
- What evidence-based interventions or programs can help fill the gaps that the assessment finds?

IDENTIFYING RESOURCES

- Where and when is the current population receiving care or service?
- What existing assets could be leveraged to improve health for the population?
- What capacity exists locally for the population?
- What health services currently exist that are complementary or overlapping?
- How are existing healthcare services funded?
- What partnerships already exist?

PROFILING THE POPULATION

- What are the key characteristics of the population (or sub-population) in question?
- What is the current health status of the population?
- What problems is the population facing?
- What factors are contributing to those problems, and what impact do they have on population outcomes?
- What services are currently being provided? Are they adequate?
- What are the local perceptions about the population (professional perceptions, patient perceptions, payer perceptions, government perceptions, etc.)?
- What are the local priorities related to this population?
- What do the members of this population want?
- Are there appropriate, clinically effective, cost-effective interventions for the population?

CHAPTER 2

Program Taxonomy

Introduction

The framework for Mobile Integrated Healthcare Practice (MIHP) is built on a continuum of healthcare, ranging from direct provision of care in the field to patient navigation. At one end of this continuum, the focus is on the direct provision of preventive care, as well as the extension of primary care to rural and underserved environments. On the other end of this continuum, the focus is not on providing care directly but rather on patient navigation—specifically, helping patients access an appropriate destination for care in urban and suburban environments.

The MIHP framework promotes diversity by proposing team-based and multi-provider care schemes that can each engage EMS, but are not limited to EMS.

The concept of deploying mobile resources to provide preventive care or extend primary care services to underserved communities is not new and has been embraced by EMS programs around the globe under the umbrella of “community paramedicine.” Indeed, the development of community paramedicine programs has offered the promise of newfound roles for EMS providers beyond the existing confines of emergency treatment and

transport to the emergency department.

More recently, however, novel programs aimed at addressing increasingly complex and specialized clinical needs in the out-of-hospital* arena have demonstrated a rapid growth in scale, scope and diversity beyond the existing community paramedicine model. The MIHP framework promotes this diversity by proposing team-based and multi-provider care schemes that can each engage EMS, but are not limited to EMS. Mobile Integrated Healthcare Practice and community paramedicine are, thus, complementary concepts and can form the basis for a natural partnership.

The growing diversity of MIHP programs can be better understood by organizing them into a preliminary taxonomy. The taxonomy provided here encompasses several different types of MIHP programs, ranging from those focused on managing patients who place high demands on the healthcare system to those that provide around-the-clock support to in-home hospice programs. It remains to be seen, however, whether MIHP programs will also benefit from a standardized approach to education, operational and clinical metrics, and regulatory constructs.

Expanding the nomenclature

Over the past several decades, a growing number of EMS systems have developed programs aimed at tackling the issues of non-emergent and unplanned healthcare. The goal of such programs has often been not only to address local community needs,

but also to promote the professionalization of EMS providers and expand the scope of their activities beyond simply responding to “emergency” incidents. In many cases, these programs have proposed a new adjunct provider—the community paramedic—to fill gaps in community healthcare, such as by providing vaccinations or extending certain primary care services in the absence of a local physician. Some of these programs, many initially developed as pilot programs, have now become permanent features of their local EMS systems and have grown to include training programs specific to the local community paramedic mission.

In recent years, EMS systems have begun to experiment more broadly with non-emergent healthcare programs that are aimed at addressing increasingly complex and specialized clinical needs, such as the management of chronic medical problems and prevention of hospital readmissions. These programs have expanded the scope of EMS-based non-emergent healthcare programs beyond the limits of community paramedicine, and even beyond the traditional boundaries of EMS. Consequently, the emerging concept of Mobile Integrated Healthcare Practice reflects a growing understanding that EMS-centric descriptors may now be insufficiently precise, and perhaps even obsolete, to describe the growing scope and diversity of such programs.

Despite the diversity of MIHP programs, common themes and defining characteristics are now present with sufficient maturity to warrant a descriptive taxonomy that expands beyond the community paramedicine model. For those considering implementation of an MIHP program, this taxonomy offers a window on the many venues and services that might be considered.

This taxonomy addresses four general types of programs:

- **Patient navigation** Programs designed to

optimize a patient’s connection with the health services that are most appropriate for his or her needs, often with the intention of reducing the patient’s reliance on EMS or emergency department care

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- **Adjunctive mobile care** Programs intended to fill specific gaps in the healthcare continuum, often with the goal of reducing the need for ED visits and hospital readmissions

- **Occupational and community health services** Programs focused on reducing absenteeism and supporting health and safety in the workplace and the broader community, including injury assessment, drug and alcohol use screening, workers’ compensation case management support and injury prevention

- **Medicine in underserved and austere**

environments Comprehensive primary care medical services provided in underserved remote communities or in locations where conventional medical care is impractical

Patient navigation

- **Management of frequent EMS users** These programs are among the most frequently undertaken MIHP projects and seek to determine the needs of patients who regularly call 911 for medical care, sometimes as often as several times per day. Interventions may include:
 - Patient education about alternatives to EMS care
 - Analysis of unmet patient needs, such as mobility issues or medication access
 - Improving patient connection to existing resources such as primary care physicians, substance abuse and mental health services, community clinics or home care
 - Real-time provider consultation with a medical control physician, with options including on-site treatment and alternative transport destinations
- **Clinical triage** These programs employ nurses in public safety dispatch centers and nurse call centers to triage callers with non-emergent medical conditions. Callers may be redirected to non-emergent healthcare resources, such as a physician's office or urgent care center, or to an appropriate social services provider. They may also be referred to another MIHP program within the community (e.g., a frequent EMS user program).
- **EMS alternative destination** These programs use enhanced medical oversight and carefully developed protocols to identify EMS patients who do not require transport to the ED and to

transport them to a more appropriate setting for care (e.g., clinic, urgent care, detoxification center, etc.).

- **Management of serial inebriates** These programs intervene with patients who present repeatedly with acute alcohol or drug intoxication. Interventions may include EMS diversion from the ED to detoxification centers, intensive case management and enforcement of abstinence-based court orders. Engagement may be as broad as system-wide diversion to detox centers or as limited as simply reporting new intoxication to court-appointed case managers.
- **Mental health intervention** These programs make use of interprofessional crisis intervention teams to defuse a confrontation or disruptive behavior, to provide alternatives to arrest or use-of-force, and to reduce ED visits arising from 911 calls. In some programs, MIHP providers may provide on-scene medical clearance to allow for direct admission to a mental health facility without an intervening ED visit.

Adjunctive mobile care

- **Readmission reduction** These programs are designed to reduce the frequency of ED visits and hospital readmission by patients who have been recently discharged from the hospital, most frequently for patients emerging from a congestive heart failure admission. Unassisted, CHF patients are very likely to return to the ED (particularly in the first 48 hours following discharge).
- **Hospice support** These programs seek to extend the timeliness and scope of support available to those caring for palliative care patients outside of the hospital and include partnerships between hospice providers and EMS to provide assessment and intervention on scene in order to resolve a crisis and determine the need for on-scene response by hospice staff.

- **Discharge transition care** These programs are intended to improve the quality and perception of a patient's transition from hospital to home and may include specialized transportation, home safety assessment, reconnection with primary care physicians, medication access and family education. Care may also include disease-process-specific visits, assessments and monitoring to bridge the first 24 to 48 hours after discharge until other home care providers assume care.

- **Episode-specific surveillance and monitoring** These programs are focused on risk reduction and improved patient safety through home monitoring of patients who might otherwise be admitted to the hospital for short-term observation following an acute episode, such as a TIA or syncope.

- **Observed dosing services** These programs consist of directly observed medication dosing and adherence support for mental health patients, tuberculosis management and similar care.

- **Laboratory services** These programs use home sample collection and point-of-care assays to promote patient adherence to care plans, improve patient acceptance and convenience, and reduce lab-related transportation costs.

Occupational and community health services

- **Workplace injury assessment** These programs employ MIHP providers to perform on-site assessment and documentation of minor occupational injuries in order to minimize inappropriate ED "report-only" visits and to reduce the risk of missed serious injuries.

- **On-site intoxicant surveillance** These programs provide testing for recreational drug use and blood-alcohol breath analysis in pre-

employment screening as part of "for-cause" intervention, or following workplace incidents such as a motor vehicle collision. Programs may include on-site "quick testing" and sample collection for forensic analysis.

- **Workers' compensation case support** These programs offer at-workplace access to rehabilitation, return-to-work planning and physical limitation assessments.

- **Primary injury prevention** These programs consist of both general community education programs and targeted activities, such as home safety assessments to prevent fall injuries in the elderly population.

- **Health assessment and promotion** These programs are focused on health promotion and include blood pressure screening, smoking cessation, body mass index assessment, and baseline 12-lead electrocardiogram acquisition and interpretation.

- **Immunizations** These programs seek to increase the number of immunized children by providing immunizations in non-traditional settings, such as public safety facilities.

Medicine in underserved and austere environments

- **Rural primary care** These programs employ MIHP providers to offer clinic-based, mobile and in-home primary care in remote communities or austere environments where on-site physician care is unavailable. Providers may possess an extended scope of practice and are frequently supported by telemetry, real-time medical consultation and physician telepresence.

- **Physician extender services** These programs provide basic medical services, such as medical histories, physical exams, diagnostic studies, un-

complicated treatments and referrals. Services are delivered by MIHP providers acting under the direct supervision of a physician.

The great diversity in MIHP programs reflects the inherent diversity of health needs that exist in local communities.

- **Remote industrial on-site care** These programs provide a range of emergency and primary care services to isolated industrial workers, such as those located on ocean oil platforms or remote construction sites. Telemetry, real-time medical consultation and physician telepresence are commonly required to definitively manage care or stabilize patients until transport off-site.

Standardization of MIHP

The great diversity in MIHP programs reflects the inherent diversity of health needs that exist in local communities. For example, MIHP programs that focus on the management of frequent EMS users may be more relevant to large urban centers than to small rural communities seeking greater access to primary care services.

This diversity, however, is problematic when it comes to developing a standard regulatory construct for MIHP across different localities and states. This is particularly true in the context of EMS in the United States, which is governed by a patchwork of state-level authorities and views the development of MIHP as an opportunity to promote professional development for EMS providers nationwide. As a result, certain EMS stakeholders have advocated for the standardization of MIHP programs in order to bring more clarity to EMS educational programs and scope of practice. Some

have even advocated for the rejection of the MIHP designation altogether, preferring instead to try to marshal new programs under the existing framework of community paramedicine.

It remains to be seen whether continuing to advocate for the EMS-specific framework of community paramedicine is in the long-term professional interests of this subgroup of MIHP providers. Nevertheless, some standardization of MIHP concepts may ultimately prove useful in helping to overcome certain regulatory hurdles to EMS participation in MIHP. Existing calls for standardization, however, have been almost exclusively focused on promoting new and diversified roles for EMS providers, rather than on defining the need for more diverse care teams and broader modalities of mobile healthcare.

It is likely too early in the development and innovation life cycle of MIHP to pursue standardization through regulation. We believe the discussion of standardization of MIHP should instead focus on the development of a common taxonomy and lexicon that embraces both the diversity of MIHP programs and the diversity of healthcare providers required for such programs to be successful. Most important, any standardization should not endorse interprovider boundaries at the expense of the partnerships and interprofessional design that are inherent in MIHP.

Infrastructure and People

Introduction

As already discussed, Mobile Integrated Healthcare Practice (MIHP) programs will only succeed if they are the product of a collaborative effort among a diverse set of organizations and individuals. Each partner in this collaborative will bring different key elements of patient-centered mobile healthcare to the table, including components of program infrastructure and necessary personnel.

MIHP programs will fail if they do not take advantage of the pre-existing healthcare infrastructure. While certain aspects of the existing infrastructure will undoubtedly require modification and adaptation, part of the appeal of MIHP programs is their ability to use existing resources more effectively to address unmet needs. Adding significantly to the existing infrastructure will, however, lead to increased costs and inefficiencies, which is exactly what regulators and payers strive to avoid.

While MIHP programs can—and should—involve a variety of different types of healthcare and social service providers, the infrastructure and workforce of EMS is well suited to provide the foundation for MIHP and to coordinate service delivery by multiple types and levels of healthcare providers.

MIHP infrastructure basic needs

A robust, successful MIHP program will require the following basic elements:

- A professional workforce, including but not limited to:
 - EMS providers

- Mid-level providers, including nurses, nurse practitioners and physician assistants
 - Physicians
 - Community health workers
 - Pharmacists
 - Home health providers
 - Hospice workers
 - Nutritionists
 - Data analysts
- Medical direction
 - Strategic partnerships
 - Training and education resources
 - Communications
 - Mobile resources and transportation
 - Integrated health records
 - Sustainable funding
 - Evaluation and measurement resources

EMS resources and MIHP

The MIHP programs described in the previous chapter and throughout these pages are characterized by a diverse mix of healthcare providers beyond EMTs and paramedics, as well as by multi-agency and institutional partnerships. MIHP's explicit pursuit of interprofessional healthcare design builds capacity for ambitious and complex programs by ensuring that the provider mix can be continually modulated to the evolving needs of each patient, a process that protects patient safety and extends the reach and potential of each MIHP program.

At the same time, many MIHP programs use EMS

systems as a central hub to coordinate the various resources necessary for an effective program. In most communities, the existing EMS system not only can provide the infrastructure to support MIHP programs, but it can also contribute to the pool of interprofessional healthcare providers. In addition, EMS systems, while they vary widely, exist

EMS providers offer a combination of skills and decision-making capability that makes their integration into MIHP very appealing.

in virtually every community, are already linked to multiple levels of the healthcare and social services community, and respond 24 hours a day, seven days a week. These elements of an EMS system, already in place, can be adapted to coordinate the efforts of all the partners in an MIHP program—and they cannot be reproduced without significant expense.

EMS workforce

EMS providers offer a combination of skills and decision-making capability that makes their integration into MIHP very appealing. The EMS workforce treats between 5 percent and 10 percent of the U.S. population each year; with fewer than 3 percent of those patient contacts involving life-threatening injury or illness, some have already started referring to the services they provide as “unscheduled healthcare” (rather than emergency medical care). Indeed, EMS providers make regular and repeated contact with patients of all ages who are suffering from a wide range of ailments that are not necessarily the result of acute sickness or injury.

EMS providers also have significant experience operating in the relatively austere out-of-hospital

arena, where they triage and evaluate patients and perform medically appropriate interventions. The ability of EMS providers to quickly and reliably respond to, assess, treat and, if needed, transport patients in the out-of-hospital environment makes them ideally suited to play an important role in MIHP programs. The EMS workforce also often includes experts in planning, coordination and communications.

In many existing MIHP programs, EMS providers receive additional program-specific training and are referred to as advanced practice paramedics or community paramedics. These designations—which are not yet officially recognized at the national level and are only beginning to be recognized in states such as Minnesota and Maine—are intended to acknowledge the expanded training that these EMS providers receive in subjects such as behavioral health, chronic disease management and relevant community resources. In many cases, these designations permit EMS providers operating within an MIHP program to exercise an expanded role—but not an expanded scope. This means that, while they may have additional diagnostic tools, patient navigation skills and decision-making responsibilities, the range of medical interventions they can provide is not actually different from other EMS providers at their level. These providers are said to operate “at the top of their license.”

Other MIHP programs actually seek to expand EMS providers’ scope of practice by employing them to perform interventions not typically included in their initial training. EMS providers participating in such a program must receive additional training and may require special approval from the appropriate regulatory or legislative body to practice outside the boundaries of their existing license. It remains to be seen which of these two models will become the standard—or if the use of EMS providers in MIHP programs continues to vary according to the needs of a particular community. Nevertheless, EMS providers engaged in MIHP programs

are already demonstrating that, with some additional education, they can provide patient-centered healthcare that addresses previously unmet needs.

In addition to operating independently, EMS providers have experience working under the direction of physicians using established protocols and decision trees and with the support of on-line consultation. Accordingly, EMS physicians can be employed to facilitate the provision of integrated around-the-clock, needs-based, in-home acute, chronic and preventive care. Indeed, EMS physicians are well versed in helping to integrate and coordinate patient care between the hospital and out-of-hospital environments and can use that experience to broaden the working dialogue to include other key community providers, including mental health, public health, social services and others.

EMS infrastructure

An MIHP program could take advantage of several aspects of an EMS system. These elements include the availability of a high-functioning readiness and response infrastructure that features near-universal access via call-takers, call triage and dispatch functions; 24/7 vehicle availability; and pre-existing communications systems linked with hospitals and medical directors, as well as treatment and documentation capabilities.

The mobility of an EMS system is one of its greatest assets and an aspect of existing infrastructure that would be difficult and impractical to replicate for an MIHP program. This mobile capacity enables EMS systems to access hard-to-reach patients and provide healthcare in diverse rural, suburban and urban settings across the country. Not surprisingly, partnerships between EMS and other community health services have long used EMS's mobile capabilities to provide immunizations, screenings, drug testing and other services in some communities. In the same vein, ambulances could serve as mobile exam rooms for MIHP programs that provide adjunctive primary care services.

While much of an EMS system's mobile capability derives from the fact that EMS providers typically operate from ambulances as part of the traditional EMS transport model, early MIHP adopters have also begun to employ other specialized vehicles to efficiently match system resources with patient needs. The mobile health resources provided by EMS go beyond the vehicles themselves: EMS providers also carry equipment that, while primarily intended for unscheduled and emergent medical care, can be adapted for MIHP as well.

As an example, most paramedics already carry cardiac monitors with 12-lead EKG capability, blood pressure and blood glucose monitors, and other diagnostic tools required for MIHP programs. Many of these devices have the ability to transmit information to other locations as part of a telemedicine system, allowing for real-time consultation with other interprofessional providers.

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The existing communications infrastructure of an EMS system can also be leveraged by MIHP programs. Some MIHP programs are already using public safety dispatch centers to help coordinate care by serving as 24/7 access points for patients enrolled in MIHP programs. Other programs are employing nurses at dispatch centers to triage non-emergent calls, ensuring that patients get the most appropriate response to their call (traditional EMS, other healthcare or even social services).

Public safety dispatch centers offer a vast information technology infrastructure for MIHP to build on, including a variety of address-linked information and geographic information systems (GIS). Linking this information with population health data has the potential to create a powerful tool for launching and supporting MIHP programs. Dispatch centers could also be used to collect and monitor biometric data on patients, allowing for real-time tracking of both patient and population health. Especially if allowed to access electronic

EMS systems are easily scalable to absorb the additional loads arising from new or expanded MIHP programs at minimal added cost.

health records, MIHP programs could employ public safety dispatch centers to bring together the best practices of hospital and insurance provider hotlines, telemetry and remote monitoring systems to create a truly integrated healthcare delivery system.

Finally, much of the EMS infrastructure features planned redundancies and excess capacity essential to emergency preparedness. As a result, EMS systems are easily scalable to absorb the additional loads arising from new or expanded MIHP programs, at minimal added cost. The use of EMS infrastructure can thus allow communities to coordinate existing resources to create a sustainable, patient-centered and cost-effective MIHP solution that leverages the proven success of EMS as a reliable and trusted community healthcare resource.

Competency and Education

Introduction

Ensuring that healthcare providers possess the necessary competencies for Mobile Integrated Healthcare Practice (MIHP) presents a unique challenge. On the one hand, healthcare providers delivering care as part of an MIHP program will have been educated (and credentialed) to practice within their respective disciplines. On the other hand, that education (including any relevant clinical experience) is likely to have been based on numerous assumptions about the location, independence and nature of a particular clinical practice—assumptions that may be inapplicable to the context of mobile integrated healthcare.

Furthermore, the education of healthcare providers generally is focused on a clinician's interaction with patients and other professionals within his or her own discipline, with little meaningful education or experience related to collaborative practice between different disciplines (e.g., medicine, allied health, social services, mental health and public health). Such collaboration, known as interprofessional practice, is at the core of MIHP. For these reasons, it will be necessary for MIHP programs to evaluate all potential MIHP providers to identify "gaps" in their competence, and to provide the education (classroom and supervised clinical experience) necessary to fill those gaps.

Competencies for MIHP

MIHP offers a rich opportunity to use the skill sets of many different types of practitioners to provide more effective and efficient healthcare to the com-

munity. In order to maximize both clinical benefit and patient safety, however, it is essential for MIHP programs to anticipate inadequacies in the education and experience of healthcare providers in all levels and disciplines when it comes to certain key areas.

Practice setting

Traditionally, the training of healthcare providers has focused on practice in a specific setting. For example, physician, nursing and respiratory therapy education often focuses on the provision of in-hospital care, with the support structures that typically accompany that environment (e.g., laboratory testing, imaging and administrative support). In contrast, EMS education trains prehospital providers to

Most healthcare professionals will need additional training and clinical experience to prepare them for practice in the mobile healthcare environment.

practice in a variety of different settings, including the back of a moving ambulance. The provision of healthcare outside of an anticipated setting (including in the "virtual" setting of telemedicine) does not change the cognitive, affective and psychomo-

tor skills that are required. It does, however, necessitate the adaptation of assessment and therapeutic processes to work in the new setting. Consequently, most healthcare professionals will need additional training and clinical experience to prepare them for practice in the mobile healthcare environment.

Clinical decisions and safeguards

Medical, nursing and allied health education also prepares healthcare providers for a predictable model of clinical decision-making. Physicians

The concept of interprofessional competencies has only recently started to be addressed across the healthcare disciplines.

evaluate and prescribe referrals, medications and procedures based on their level of credentialing within the hospital; nurses deliver care based on individualized nursing care plans with prescribed medications; and EMS professionals deliver a narrow set of therapeutic interventions according to standing protocols. Those decisions always come with familiar safeguards: Physicians can order more tests or consult with colleagues; nurses can also consult with colleagues and physicians; and EMS providers can simply default to transporting a patient to the emergency department.

MIHP replaces some of the “traditional” patient care safeguards with ongoing and consistent communication between MIHP providers, access to longitudinal health records and telemedicine strategies. Accordingly, it is important to plan for changes in available safeguards, including by developing and requiring the use of new safeguards in

the MIHP environment.

In addition to patient care safeguards, the availability of some assessment strategies may be reduced in the MIHP setting as compared to the hospital environment. In addition, some medical interventions may simply be unavailable, while others (such as home monitoring or transport to alternative outpatient settings) may be new to MIHP providers.

Evolving body of evidence

The safety and efficacy of clinical care as practiced by all health disciplines should be closely aligned with a supporting body of evidence. In addition, healthcare practice should be evidence-based and evolve with changes in the available evidence. As the development of MIHP is still in the early stages, however, a substantial body of evidence does not currently exist to guide its practice. As a result, clinical leaders and healthcare providers in MIHP must be able to adapt evidence from other disciplines in order to inform their practice. MIHP providers must also anticipate that their practice will change—potentially in significant ways—as the body of evidence supporting MIHP develops.

Interprofessional competencies

Interprofessional competencies are particularly important to MIHP. Indeed, what sets MIHP apart from other healthcare delivery models is not its mobility (EMS and home health care already deliver care to the home), its particular knowledge base (the clinical principles of MIHP remain based in the foundation of medicine) or its targeted patient needs. Rather, it’s the MIHP model’s emphasis on interprofessional collaboration between a diverse set of disciplines and healthcare providers that sets it apart.

The concept of interprofessional competencies has only recently started to be addressed across the healthcare disciplines, and most healthcare education programs are still unfamiliar with them. A number of organizations, however, including the

World Health Organization and the Interprofessional Education Collaborative, have developed competencies for interprofessional practice.⁶ One commonly used model focuses on the relationship between three types of competencies in collaborative practice: common, complementary and interprofessional.⁷

Common competencies are skills and knowledge that are present across most disciplines within a collaborative health practice. A common competency in the MIHP context may include the fundamental assessment of cardiovascular function (e.g., evaluating skin color, vital signs, mental status, cardiac output and signs of cardiac failure), as most clinicians (i.e., physicians, nurses, EMS providers and cardiac rehabilitation specialists) will have some or all of these skills.

Complementary competencies are skills and knowledge that are unique to a specific discipline within the practice and complement the common competencies. In an MIHP program treating patients with heart failure, these individual professional competencies may include hemodynamic monitoring of cardiac function (specialized physicians or nurses), stress testing (specialized physicians or physical therapists), assessment of activities of daily living (occupational therapists) or medication reconciliation (nurses, physicians or pharmacists). These complementary skills are not all possessed by any particular member of a collaborative healthcare team but, when combined in an integrated healthcare practice, provide the basis for a team-based approach to care that uses each healthcare provider's unique capabilities.

Interprofessional collaborative competencies are skills and knowledge that are required in order to ensure that the common and complementary competencies possessed by multiple disciplines and healthcare providers are applied in a manner that maximizes patient and community benefit. Common and complementary competencies are of

limited value if they are not integrated in a collaborative manner to provide patient care. Examples of interprofessional competencies include the ability to recognize one's own limitations and role, communicate with patients and other healthcare providers, and perform as a productive member of a team.

Identifying and assessing required competencies

Successful implementation of MIHP programs will require the identification of the common, individual complementary, and interprofessional competencies needed for MIHP providers to meet the unique needs of the population they serve. This evaluation will be critical to ensuring that all necessary competencies are available; program leaders should not assume they know the competencies of individual providers based solely on their levels of certification or education. Evaluating competencies will also guide the assessment of provider competency gaps and educational interventions undertaken to fill them. Eager communities may attempt to move forward without taking this step, but doing so may unnecessarily subject the population to care by a disconnected and potentially conflicted delivery team that will not meet the community's needs.

Required competencies may be classified according to two attributes: type of competence (common, complementary or interprofessional); and type of knowledge or skills required (cognitive, psychomotor or affective). In the MIHP context, essential cognitive knowledge may include an understanding of the physiology and signs of heart failure. Similarly, necessary psychomotor skills may include the ability to auscultate lung sounds, palpate for pedal edema and measure a blood pressure. In the affective domain, the ability to demonstrate empathy to patients and collaborate with other providers may be most important. Indeed, affective domain issues are critical in the development of MIHP programs because such programs represent a significant change from the healthcare status quo; change

management is dependent on understanding and dealing with affective judgments and values.

There are many different methods available to assess for required competencies in MIHP providers, and consideration should be given to the most appropriate method for measuring each specific type of competency. Some of the methods of assessing competencies, and examples of the types of competencies they can be used to assess, include:

- Written exams (cognitive)
- Case studies (cognitive, affective)
- Simulations (interprofessional, psychomotor)
- Isolated skills demonstrations (psychomotor)
- Essays (affective)
- Interviews (affective, interprofessional)

Filling competency gaps

Resources

Once competency gaps have been identified, MIHP programs should conduct an assessment of the educational resources available in a particular community, in order to determine whether the capacity exists to provide the training and education necessary to fill those gaps. Often, healthcare delivery organizations only look inward and rely on internal resources to address educational needs. However, in many communities, capable resources exist that may be able to develop and deliver educational and training content that meets the needs of MIHP. Some of those educational resources include:

- Medical and nursing schools
- Allied health programs
- Online education programs
- Public and mental health agencies
- Local healthcare providers
- Local organizations or associations

As an example, several MIHP programs have sought out local cardiologists to provide instruction to MIHP providers who will be conducting home visits to cardiac patients. The use of local health-

care professionals to address individual professional competency gaps also serves to promote interprofessional competencies by allowing instructors and students—who will be collaborative partners in the program—to learn from and about each other.

Curriculum

Because MIHP encompasses a diverse range of individual programs, specific MIHP program competencies—and therefore educational needs—will vary widely. Accordingly, a “core curriculum” should be developed based on gaps that are found across different disciplines and healthcare providers. As an example, an MIHP core curriculum should include interprofessional competencies, which are not adequately addressed in most healthcare education programs.

Competency gaps that are confined to specific disciplines or providers should be addressed through needs-based education tailored to those specific groups. This education will typically focus on complementary competencies that were not part of providers’ prior education and training, or did not receive enough emphasis. Topics might include cognitive competencies (for example, providing advanced pharmacology education to paramedics), psychomotor skills (such as teaching nurses or behavioral health specialists to operate an ambulance stretcher) or affective skills (such as providing EMS providers with the resources necessary to provide effective advice to patients regarding changes in their behavior). The needs-based training will also be influenced by the specific types of programs being developed; for example, a program aimed at working with hospice patients will likely require some education on hospice and end-of-life issues for all providers.

Educational initiatives related to MIHP should also take advantage of opportunities to train healthcare providers to communicate more effectively with patients, enhance provider awareness of the wide range of health literacy and decision-making skills

that exist among consumers, and instruct providers on the need to respond appropriately to cultural and language preferences. Indeed, all medical and allied health education and training will eventually need to be revamped in order to become more patient-focused, to incorporate education on patient communication, to teach healthcare providers of all types to foster patient autonomy and self-management, and to encourage patient engagement in healthcare decision-making.

Delivery methods

Because of the distributed nature of MIHP, the delivery methods for MIHP educational content should be as flexible as possible—while still allowing for the development of interprofessional competencies such as teamwork and a multidisciplinary approach to healthcare. Options for delivering MIHP content, which may be classified according to location, timing and method, include the following:

Location

- Face to face
- Remote presence
- Online

Timing

- Synchronous (all learning occurs at the same time)
- Asynchronous (students learn at a time convenient to them)

Method

- Lecture (one way)
- Discussion (two way)
- Demonstration (of a skill)
- Modeling (of behavior)

Some MIHP educational content may not be appropriate for every delivery option. For example, teaching psychomotor skills often requires at least some direct interaction with the instructor to ensure competent performance. Student charac-

teristics may help to identify the most appropriate delivery option. For example, mature learners are often better able to succeed in self-paced online learning experiences than younger learners. At the same time, younger learners may be more comfortable with online education platforms. In any case, careful matching of MIHP educational content with the most appropriate delivery strategy will enable MIHP programs to create learning opportunities that make the most efficient use of student time and available educational resources.

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Barr's Three Types of Professional Competencies

CHAPTER 5

Clinical Leadership and Medical Oversight

Introduction

Medical oversight is essential to the effective and efficient performance of Mobile Integrated Healthcare Practice (MIHP) programs. Differences in legal requirements, program design and other factors, however, mean that no one model exists for MIHP medical direction.

Generally, the oversight of a community paramedicine program is the responsibility of the local EMS medical director. While a need for these programs may exist in rural systems that lack full-time paid medical directors, direction of community paramedicine programs is ideally not relegated to a volunteer director. Because they involve the practice of medicine, true medical oversight is required.

For many MIHP programs that involve collaboration among many different types of providers, clinical leadership need not be provided by any particular professional and, in many instances, it may be determined organically. The specific needs of the target population may require content expertise from non-physician clinicians. Nevertheless, a clinical leader should serve as the program's hub and help integrate the team. As MIHP programs are developed in response to community needs, the appropriate individuals to lead and retain oversight responsibilities may become readily apparent. These individuals should possess relevant competencies and expertise.

In any given community, there may be multiple

MIHP programs serving different target populations with different needs. These programs may be led by different individuals with specific content expertise. Nevertheless, active partnerships and shared responsibility with local public health and specialty groups will play an essential role in the success of all MIHP programs, regardless of type.

The clinical leader will need to assume the roles of patient advocate, community liaison and political problem-solver.

Responsibilities of the clinical leader

Leadership of an MIHP program involves direct medical oversight, patient care and administrative responsibilities. Oversight activities will encompass clinical direction of the program, protocol development (including the development of screening tools and precise inclusion/exclusion criteria) and clinical evaluation (including case review). In addition, the clinical leader will be responsible for ensuring that competent and appropriately educated professionals staff these programs and that appropriate metrics, including patient experience and safety, are developed and evaluated.

The clinical leader will need to assume the roles of patient advocate, community liaison and political problem-solver. Meetings with stakeholders and

serious efforts to develop access to health information exchanges will be critical. When challenges emerge, intervention and problem-solving will also fall under the scope of the clinical leader, as will the responsibility to develop a strategy for shared risk among partners and a method for assessing and reporting savings to the community, patients and stakeholders. The casual involvement of an advisory physician to perform clinical leadership functions will not be sufficient to fulfill these wide-ranging responsibilities.

Additional issues and considerations that will require the attention of a clinical leader may include:

- Scope of practice, including the possible need to advocate for an extended role
- Regional variations in licensure and credentialing
- Special requirements of the particular out-of-hospital or mobile practice environment
- Needs and expectations of the healthcare system and payers
- Program financing, including reimbursement and other funding models
- Multi-agency collaboration
- Community needs and the perception of local medical societies and other stakeholders
- Legal issues, including contractual arrangements with providers and other participants
- Regulatory oversight and general administrative program requirements
- Statutory mandates and regulations regarding physician involvement in medical practices, including state and board requirements, scope of practice restrictions and professional liability

Qualifications of the clinical leader

Leading an MIHP program requires several different skill sets. Excellent leadership skills are, of course, necessary, as is basic clinical acumen for population-based care delivery. Yet one of the most important clinical leadership skills necessary is the ability to liaise and build consensus among

community leaders and stakeholders. This is a role that has been termed the “integrator” by Donald Berwick and his colleagues.⁸ In order to be a champion of interprofessional collaborative practice, an awareness of the spectrum of practitioners that can potentially become involved in MIHP is also essential.

Qualifications of a clinical leader include the ability to:

- Partner effectively with other medical professionals in the community
- Work in conjunction with public health agencies
- Advocate before policymakers and other government officials
- Communicate effectively to a diverse set of audiences
- Develop, measure and evaluate appropriate process and outcome measures

Relevant expertise

Leaders of MIHP programs must have expertise in clinical areas and program management and have a knowledge of local and community resources. Duties may include establishing and maintaining relationships with hospitalists, discharge planners, primary care providers, mental health professionals and other clinicians involved in the program. Members of the clinical leadership team will also need some expertise in program planning (a responsibility that should be shared with other agencies and organizations) and program evaluation.

Additional areas of relevant expertise may include:

- General public health concepts and principles

- Interprofessional values and ethics associated with team-based care, including the roles and responsibilities of team members, teamwork strategies and accountability sharing
- Healthcare financing and reimbursement
- Existing laws and regulations and current regulatory climate
- Available communications technologies
- Relevant modes of transportation
- Electronic medical records and documentation
- Appropriate medical tools and equipment
- Personal protective equipment and safety gear
- Applicable medical literature and other decision support resources
- Physician continuing medical education and lifelong learning tools
- Information resources regarding specific patient conditions and circumstances
- Hospice and advanced illness care
- Hospital at home concepts
- Mobility impairment issues
- Mental health concepts and resources

An EMS medical director who is active with public health officials and knowledgeable about local community needs and resources may be able to take on the clinical leadership of an MIHP program. Indeed, the core content established for EMS medicine includes a thorough review of public health emergency topics.

In other instances, clinical leadership responsibilities may be dictated by the type of program being established, as well as the types of providers involved. The clinical leader may be the content expert for a specific program (e.g., a social worker for a mental health-focused program). Alternatively, the clinical leader may wish to work in conjunction with a content expert. In any case, it will be important to recognize situations in which the population needs require the use of interprofessional teams in order to assemble the expertise necessary to meet both patient and program needs.

Clinical culture and evidence-based medicine

Clinical leaders of any MIHP program must understand the unique challenges of out-of-hospital medicine and be able to establish an effective clinical culture. Care that is provided outside of the hospital often occurs in unstructured environments and may be subject to unforeseen environmental factors. In addition, exam resources and treatment options will likely not be the same as they would be in a clinical facility. Family and caregiver interactions may also require that providers employ additional resources and strategies.

Among the goals of the interprofessional collaboration inherent in MIHP programs is to ensure that the healthcare provided is evidence-based and that patients benefit from a healthcare system that is continually learning through clinical research. The development and implementation of evidence-based, interdisciplinary protocols or guidelines will ultimately become the responsibility of the clinical leader, including the development of alternative destination programs and delivery of end-of-life education.

MIHP generally should be informed by the best evidence, and resources should be allocated to expand the evidence base through additional research. MIHP activities should also be structured to provide both patients and providers with a better understanding of the value of evidence-based medicine and its contribution to patient outcomes and improved quality. At the same time, however, the clinical leader should maintain realistic expectations and remain mindful that evidence-based medicine is not yet well understood or widely accepted by either patients or providers.

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Financial Considerations

Introduction

The primary motivation for developing a Mobile Integrated Healthcare Practice (MIHP) program must be to address unmet community health needs. MIHP programs designed with profit as the central motivator are unlikely to be successful from a financial or health outcomes perspective. Nevertheless, financial considerations cannot be ignored and are critical to creating a sustainable MIHP program.

Cost of service and program funding are the two most important financial considerations and should be addressed at all stages of an MIHP program's development, from program planning to program evaluation. Indeed, almost immediately after a population health needs assessment has been completed, the focus should turn to projecting the costs of a particular MIHP program and identifying what funding options may be available.

Cost of service

The cost of service for any particular MIHP program will vary based on the size of the program, the nature of its mission, the scope of its activities, and the pre-existing relevant services and infrastructure. Included in this cost will be capital expenses for any additional equipment that may be required to operate the program, personnel costs for program providers and staff, and costs associated with the development and delivery of specialized training. The use and redeployment of existing resources and personnel may result in some initial cost savings but, ultimately, may not be in the best

interests of a program's long-term sustainability or quality of service.

Personnel costs will likely account for the greatest proportion of overall service cost. In order to employ personnel in the most cost-effective manner, MIHP programs should look to the integrated health delivery model already employed by many hospital systems. These systems use a wide range of healthcare providers to match the most appropriate level of care to each healthcare need. Clinicians, including EMS providers operating in non-traditional roles, operate at the top of their respective scopes of practice and training in this model.

The cost of "readiness" must also be factored into overall service cost if an MIHP program intends to offer services around the clock or include an on-call response component. Because making program resources available at all times is expensive, an MIHP program should seek to balance readiness against productivity. Achieving an optimal balance may prove difficult but, at the very least, an MIHP program should be conscious of both the readiness and productivity of its resources. This will allow the program to accurately calculate its overall cost of service, determine the most appropriate allocation of program resources and promote a cost-effective operation.

Program funding

There is no standard model for funding or cost reimbursement for MIHP programs. Financing often varies depending on the population being served,

the types of organizations involved in the program (e.g., public, private, EMS, insurance companies or hospitals) and the program's mission (e.g., addressing frequent 911 callers vs. reducing hospital readmissions). Funding models that are most relevant to MIHP programs include the following:

- Fee-for-service
- Public subsidy
- Private subsidy
- Shared savings
- Risk sharing

Fee-for-service

The delivery of most healthcare services today is based on a fee-for-service model in which a healthcare provider receives a fee for the delivery of services to a patient. The fee is billed to a healthcare payer, which may be public (e.g., Medicare and Medicaid) or private (e.g., an insurance company or the patient). Bills for healthcare are based on a diagnosis included in the International Classification of Diseases (ICD). Each diagnosis has a billing code that is traceable from billing to reimbursement.

Expanding the scope of EMS fee-for-service reimbursement to include non-transport MIHP services has been contemplated at both the state and federal levels.

Limited ICD billing codes currently exist for MIHP. Physicians and some non-physician providers (such as advanced practice nurses or physician assistants) may bill for providing direct services if a patient meets specific requirements. An EMS-based MIHP program, however, will likely not be able to bill for non-transport healthcare services.

This is because the federal reimbursement plan for emergency medical services (which has been adopted by most private payers) requires that a patient be transported to the hospital in order for the service to qualify for reimbursement. A few EMS-based MIHP programs have sought reimbursement for certain services under ICD codes for discharge transitional care (e.g., follow-up home visits), but reimbursement for such care is generally limited to physicians or home health and hospice providers.

Expanding the scope of EMS fee-for-service reimbursement to include non-transport MIHP services has been contemplated at both the state and federal levels. In 2012, Minnesota established a program for Medicaid reimbursement of certain MIHP activities in the realm of community health services and adjunctive mobile care (including health assessments, immunizations, disease management, lab sample collection and discharge transition care). This outcome was the culmination of a legislative lobbying campaign that lasted several years and included the earlier passage of a law granting legal recognition to community paramedics. Similar efforts in other states and at the federal level are still in the very early stages.

Public subsidy

Several MIHP programs, specifically those implemented by public EMS systems, rely on taxpayer funding. Most often, these programs focus on patient navigation as a means to address the problem of frequent 911 callers, avoid unnecessary ambulance transports and connect people who access the healthcare system through the portal of EMS to more appropriate healthcare resources. The ultimate goal of these MIHP programs is usually to reduce the burden on EMS resources resulting from the use of 911 for non-emergent conditions, and consequently increase the state of EMS readiness without additional resources.

EMS systems that implement such programs are not necessarily concerned with recouping MIHP

program costs. Instead, they are seeking to generate overall cost savings by efficiently managing calls for non-emergency healthcare service.

Public grant funding for pilot programs is another example of public tax subsidy funding. Federal and state authorities have awarded substantial grants to MIHP programs exploring the best way to connect patients to cost-effective healthcare. Many of these grants have been funded by government healthcare payers (e.g., the Center for Medicare and Medicaid Innovation) seeking to identify evidence of overall cost savings rather than to recoup program costs. Indeed, it is estimated that Medicare would save almost \$600 million annually if non-emergent patients were diverted from the ED and instead provided more cost-effective, appropriate healthcare options.⁹ Grant funding, however, is not a sustainable source of funding for MIHP. MIHP programs seeking a public subsidy should thus focus on developing long-term relationships with local government agencies and stakeholders.

Private subsidy

Private subsidies are also an important source of funding for MIHP programs. This is often the case for MIHP programs associated with hospitals and private healthcare payers. As with publicly subsidized programs, the financial goal of these programs is often to generate overall cost savings rather than to recoup program costs. Hospitals are particularly interested in MIHP programs that aim to reduce hospital readmissions through adjunctive mobile care, because they have the potential to generate significant cost savings by avoiding financial penalties under the Hospital Readmissions Reduction Program.¹⁰ In the Pittsburgh area, for example, two private insurance companies have jointly funded a two-year pilot program that employs EMS providers to deliver discharge transition care for CHF and COPD patients, with the goal of reducing hospital readmissions.¹¹

Like public healthcare payers, private healthcare

payers such as insurance companies have also shown a willingness to fund MIHP programs that aim to reduce healthcare costs. Programs that focus on community health (e.g., health assessment and immunizations) or mobile adjunctive care (e.g., discharge transition care and disease management for asthma patients) may be able to partner with private healthcare payers who are willing to pay for

Hospitals are particularly interested in MIHP programs that aim to reduce hospital readmissions through adjunctive mobile care.

those services to be provided to their members. The key for MIHP programs will be to determine which MIHP services are needed in a particular population, identify those organizations that may benefit from the provision of such services (in terms of lower overall healthcare costs) and then seek to collaborate with them.

In addition to insurance companies, other sources of private subsidy funding may include home health agencies, hospice agencies and other out-of-hospital providers, as well as private grant money.

Shared savings

Rather than seek direct reimbursement for healthcare services provided or subsidies for program costs, an MIHP program may instead seek to share in the cost savings generated by the program. For example, an MIHP program that partners with a local hospital to reduce readmissions may negotiate to receive a certain portion of the cost savings (in terms of readmission penalties avoided) that result from adjunctive mobile care services (such as follow-up visits and periodic health assessments).

Similarly, an MIHP program that focuses on reducing visits to the ED may negotiate with an insurance company to receive a portion of the healthcare cost savings (relative to the expected cost of care) that result from patient navigation services.

Population-centered reimbursement models currently represent only a small spectrum of healthcare reimbursement, but they can provide a strong incentive for ACOs and other at-risk entities to deliver effective healthcare at a lower cost.

Prior to adopting a shared savings model for program funding, an MIHP program will need to determine the magnitude of potential healthcare cost savings in the target community (e.g., the volume of hospital readmissions or the percentage of patients that can be safely diverted from the ED). If projected healthcare cost savings alone will not be sufficient to provide sustainable program funding, an MIHP program may seek to combine them with other funding mechanisms (e.g., as a performance-based bonus to direct subsidies).

Risk sharing, accountable care organizations and the future of healthcare financing

Each of the reimbursement models discussed thus far presumes that the fee-for-service model will continue to form the basis for healthcare reimbursement in the United States. There is growing support, however, for a move away from fee-for-service reimbursement and toward population-

based payment models. Such “risk sharing” models were expressly contemplated in the Patient Protection and Affordable Care Act, which created the Medicare Shared Savings Program and allowed Medicare to contract with accountable care organizations (ACOs) for the care of defined sets of Medicare beneficiaries.

Under one such model, an ACO (or another “at-risk entity”) will contract with healthcare payers to assume financial responsibility for the healthcare of specific patient populations. In exchange, the ACO will receive payments based on the total expected cost of care for each population, rather than fee-based reimbursement for each healthcare service provided. In a fully capitated payment system, the ACO will be paid a fixed, per-capita amount for all of the healthcare services provided to a population.

Population-centered reimbursement models currently represent only a small spectrum of healthcare reimbursement, but they can provide a strong incentive for ACOs and other at-risk entities to deliver effective healthcare at a lower cost. These models also offer an opportunity for MIHP programs to capitalize on the primary value proposition of MIHP: providing the right care, at the right time, in the right place, and at the right cost. An MIHP program that is able to deliver cost-effective healthcare to a particular population may be able to share risk with, and secure funding directly from, an ACO.

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Legal and Political Considerations

Introduction

Mobile Integrated Healthcare Practice (MIHP) can arguably be characterized by its non-traditional nature: employing interprofessional providers in non-traditional roles to provide new and innovative services in non-traditional settings. As a consequence, leaders of MIHP programs must be prepared to address legal and political concerns regarding how to apply existing regulatory structures to this new practice model. Chief among them are issues relating to scope of practice and opposition from existing healthcare providers.

Scope of practice

Scope of practice regulations vary greatly between states but have generally been constructed without a view of the unique roles envisioned by integrated and interprofessional healthcare practice. For example, many states restrict EMS providers from practicing outside the context of ambulance transport.

In California, scope of practice regulations narrowly define paramedics as healthcare providers only when operating at an emergency incident arising through the 911 system, and then only within a tightly prescribed scope of practice designed 40 years ago to provide out-of-hospital resuscitation and related care. This rigid framework fails to acknowledge the ability of paramedics to effectively assess both emergent and non-emergent patients, communicate their assessment findings to medical control for consultation and care direction, and even provide definitive care to certain patients in

their homes—skills that are valuable to MIHP and not universal in the healthcare system.

The simplest way to address the question of scope of practice is with a truly integrated and interprofessional MIHP program in which healthcare providers from various disciplines act within their respective scopes of practice. Indeed, one of the goals of MIHP is to provide each patient with the most appropriate and cost-effective care, at least in part by ensuring that each healthcare provider who cares for a patient is practicing efficiently at the top of his or her established scope of practice. Expanding the scope of practice for any practitioner should

The simplest way to address the question of scope of practice is with a truly integrated and interprofessional MIHP program in which healthcare providers from various disciplines act within their respective scopes of practice.

be seen as a last resort, a solution only if there is no other cost-effective and practical way to achieve the desired outcomes.

Certain existing scope of practice regulations, however, may ultimately prove too restrictive to allow for effective MIHP. In such cases, it will be necessary for proponents of MIHP to petition state regulators and policymakers to expand existing scopes of practice or recognize a new category of MIHP provider with an expanded scope of practice. Such efforts will likely require MIHP proponents to dedicate significant time and effort.

Indeed, a law granting official recognition to community paramedics in the state of Minnesota underwent 19 revisions and required a concerted lobbying effort over several years before it was finally passed by the state legislature in 2011. In California,

The use of MIHP providers to provide healthcare services in non-traditional roles and settings may be perceived as an intrusion into the domains of other healthcare providers.

the state is considering authorizing several pilot programs in order to evaluate a possible expanded role for EMS providers before making any major regulatory or legislative changes.

Opposition from existing healthcare providers

The use of MIHP providers to provide healthcare services in non-traditional roles and settings may be perceived as an intrusion into the domains of other healthcare providers. If this issue is not carefully addressed, MIHP programs are likely to encounter significant political resistance from various healthcare stakeholders. For example, nursing groups may oppose the use of other healthcare providers to deliver immunizations or provide discharge transition care. Similarly, home health

care agencies may resist the delivery of adjunctive mobile care and physician extender services in the setting of a patient's home. Accordingly, it is absolutely essential that MIHP programs seek to collaborate rather than compete with existing healthcare providers in a community.

Competition should be avoided in the first place by identifying the healthcare services that are already being provided in a particular community. Instead of replicating existing services, an MIHP program should target gaps in the services being provided. For many communities, one such gap is the provision of out-of-hospital healthcare services outside of normal business hours. An MIHP program may be able to partner with home health care or hospice providers to triage and appropriately navigate their patients when they require assistance outside of normal business hours (e.g., when they call 911). MIHP programs can also avoid competition by using existing healthcare providers to provide MIHP services (e.g., employing nurses to triage non-emergency calls to 911).

Other legal issues

MIHP programs may also encounter other legal issues, ranging from compliance with billing and privacy regulations (such as HIPAA) to possible violations of federal and state anti-kickback laws. It is recommended that MIHP programs obtain legal consultation regarding such issues and incorporate legal review into their program development processes.

Health Information Technology

Introduction

Integration of health information is a vital component of any Mobile Integrated Healthcare Practice (MIHP) program and must be considered at the outset of the planning process. While the importance of face-to-face and telephone communication should not be ignored, health information technology (IT) can play a critical role in providing coordinated care in a cost-effective manner. Indeed, such technology can facilitate communication, data collection and reimbursement, and also improve overall access to care.

Healthcare delivery that truly integrates available health information will be linked from the point of patient care to a variety of other sources, potentially including hospitals, health information exchanges (HIEs), medical laboratories, billing centers and other healthcare providers. Otherwise, lack of access to relevant information during patient encounters may negatively impact patient health and lead to excess costs.

Integrating medical records

Improving both care coordination and access to health information can help prevent medical errors, reduce costs and improve overall patient health. Stories abound of physicians prescribing medications that interact with medications prescribed by another physician, or tests being performed on the same patient multiple times because one provider had no way of knowing whether it was already performed by another provider. One way to prevent these potentially deadly and costly errors is

to integrate health records using HIEs.

The U.S. Office of the National Coordinator for Health IT has described three types of health information exchanges:¹²

1. Directed exchange A healthcare provider can send specific information about a patient to another provider. Example: A primary care physician electronically sends a patient's record to a specialist prior to the patient's appointment with the specialist.

2. Query-based exchange A healthcare provider can search a database for patient information. Example: An emergency room physician can search for and electronically download the cardiologist's record for a patient who arrives at the ED with chest pain.

3. Consumer mediated exchange A patient can manage the electronic storage of his or her own health information. Example: A patient logs in to a commercial website following a visit with her primary care doctor and adds any new medications to her health record. At a visit with a specialist, the patient can log in with the physician and review that information.

Ideally, integrated electronic health records (EHRs) should be as comprehensive as possible and allow data to be shared in all directions (allowing providers to both access and enter information). Unfortunately, however, the complete integration of health

records faces several barriers. For instance, records systems are frequently incapable of communicating with each other, and expensive and complicated interfaces must often be built to link them. In addition, patients are often seen by several different healthcare providers using a wide range of IT products, which may also require the development of multiple interfaces in order to be integrated together.

Having health information that is readily accessible, integrated and easy to use will be critical to the long-term success and sustainability of an MIHP program.

MIHP programs should, in theory, be able to take advantage of HIEs. However, this may prove difficult in practice. For example, hospitals may balk at sharing health information with outside agencies, including EMS. In addition, a patient might see providers in several different offices, each using different EHRs, which may not integrate with EHRs from home health, EMS, lab and hospital providers.

More important, unlike hospital-based providers (who often already have access to hospital and physician patient health records) and traditional outpatient providers (who usually have agreements with hospitals for read-only access to patient health records), EMS agencies typically track patient health information using patient care reports (PCRs) that are independent of other patient health records and also are incident-based (i.e., for each interaction with a patient, a record exists, and each record is separate and distinct from the rest).

Consequently, one critical task of any EMS-based MIHP program will be to develop a patient-based

system that can integrate PCRs into the overall health record for a patient. Out-of-hospital MIHP programs have tackled this problem in different ways, from using commercially available software to creating their own programs to draw patient health information from PCRs.

There is no single solution to integrating health records. At the national and regional level, the development of HIEs is a promising step toward the creation of a single electronic medical record for all patients. But privacy and security concerns, as well as questions of funding (some large, regional HIEs created with grant funding have been unable to secure commitments for continued financial support), may stall the progress of regional HIEs. Moreover, the existence of multiple HIEs in the same region may actually make accessing health records more difficult, especially if all of the HIEs must be linked together in order to provide useful information to an MIHP program.

In the short term, MIHP programs may have to rely on creative solutions for integrating health records, such as obtaining read-only access to several different sources. There may also be creative ways to convert incident-based EMS reports to medical records by linking them to patient identifiers and reorganizing PCR information on that basis. Regardless of how the information is obtained and shared, having health information that is readily accessible, integrated and easy to use will be critical to the long-term success and sustainability of an MIHP program.

Telemedicine Telemetry

Advances in mobile technologies have created significant opportunities for patients to be monitored remotely. MIHP programs can use these technologies to monitor, record and transmit health information directly into a patient's medical record. This can happen when an MIHP provider is with the patient (in order to share the information with

other MIHP providers), or even when a provider is not present.

For example, mobile technologies may be used to alert an MIHP provider that the weight of a CHF patient has increased, allowing for earlier interventions that prevent the condition from worsening. Other possibilities include remote monitoring of blood pressure, heart rate, blood sugar and more.

Real-time teleconsult

Mobile technologies also make it possible for MIHP providers to consult with physicians, behavioral health workers and other healthcare professionals. Video conferencing using computers, tablets and mobile phones can allow MIHP providers to practice within their scope of practice while also receiving real-time assistance from specialists and more advanced providers who can visualize patients and see what the MIHP providers are seeing. Essentially, MIHP programs can use technology to connect MIHP providers operating in the out-of-hospital environment with advanced resources that can provide clinical guidance.

For example, an MIHP paramedic whose patient's pedal edema appears to be worsening can share pictures and video with the patient's cardiologist, who can then work with the paramedic to develop a care plan to prevent the patient's condition from worsening, while also avoiding a costly trip to the physician's office or ED. The goal of teleconsults is not to replace regular, in-person appointments with physicians or specialists, but rather to allow MIHP providers to practice at the top of their scope of practice by providing them with real-time decision support.

Physician telepresence

In remote regions or underserved areas that lack adequate access to primary or specialty care, it may not be possible for physicians and patients to meet in person. In these settings, MIHP providers may be able to visit a patient instead and, using mobile

technologies such as videoconferencing, serve as the "hands" of a physician who is only present in a virtual sense. For example, a physician may be able to speak with a patient in real-time while the MIHP provider performs hands-on skills, such as assessing vital signs, drawing labs or performing an ECG.

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CHAPTER 9

Program Evaluation

Introduction

Much of the attention surrounding Mobile Integrated Healthcare Practice (MIHP) has been focused on program development, operational requirements and potential benefits (both clinical and societal). However, the long-term viability of any MIHP program ultimately rests on its ability to measure and evaluate the program's impact on patient health, the provision of healthcare and healthcare costs. Data collection and performance measurement are essential for qualifying and quantifying those impacts. They also provide the foundation for accurate and meaningful program evaluation.

Program evaluation is necessary in order to ensure that MIHP programs provide the patient-centered benefits they promise. In the history of medicine, many cases exist in which interventions were initially touted as medical successes but later found to provide no true clinical improvement. Out-of-hospital cardiac arrest resuscitation provides a good example: After several decades of measuring success (and interventional effectiveness) in terms of return of spontaneous circulation (ROSC), acute care providers eventually realized that, while ROSC is required for survival, it falls far short in terms of measuring resuscitation success from the patient's perspective. In its place, they adopted survival to discharge from the hospital, a measure of performance that was more appropriate in light of the ultimate goal: for cardiac arrest patients to be discharged from the hospital and return to their previous quality of life.

Researchers have now created a carefully defined data set for resuscitation outcomes that measures ROSC, survival to discharge and level of neurologic function at discharge.¹³ These data have allowed for a more meaningful evaluation of clinical interventions (and have informed several changes in clinical practice) for out-of-hospital cardiac arrest.

MIHP programs should develop appropriate performance measures, collect relevant data and engage in focused program evaluation in order to ensure effectiveness, sustainability and patient satisfaction. Performance measurement and program evaluation should also serve as the basis for developing and implementing future initiatives and for weighing the MIHP program options, particularly when it comes to allocating limited funding and resources.

Performance measures

Performance measures for an MIHP program should be developed prior to implementation and be based on the stated goals of that particular program. Indeed, the main purpose of performance measures is to help define the successful achievement of program goals. They are also useful in determining whether progress is being made toward those goals. Accordingly, one of the first things to be done when implementing an MIHP program is to craft relevant performance measures.

There are several different types of performance measures that may be employed by an MIHP program. *Structure measures* (such as the number of

MIHP providers) may be helpful in determining the effectiveness of efforts to establish and build out a program. Similarly, *process measures* (such as the number of patients seen by an MIHP program) may be helpful in determining the program's success in reaching out to target populations. Most important, however, *outcome measures* (such as improvements in individual patient health or the overall health of a community) can provide a true picture of the success of an MIHP program in achieving its goals. They can also inform a program's continuous quality improvement efforts. Finally, *efficiency measures* (such as the cost of care per patient) may be helpful in determining whether an MIHP program is providing healthcare in a cost-effective manner.

Once an MIHP program has developed relevant performance measures, it should establish targets for each measure and then regularly monitor progress. Initially, performance targets may consist of incremental steps toward program goals. Ultimately, however, an MIHP program should evaluate its performance against the full achievement of its program goals.

MIHP performance measures, regardless of type, should encompass three important areas: operational performance, healthcare quality and total cost of care.

Operational performance

- Types of performance measures: structure, process, outcome
- Sample performance measures for operational performance:
 - Number of interventions delivered (e.g., immunizations)
 - Proportion of patients recruited who agree to participate
 - Proportion of patients who are assigned a care manager

In measuring operational performance, it is important to review and quantify resource utilization.

After all, resource utilization should be tied to an MIHP program's needs assessment, and its performance on this measure will inform judgments regarding the program's sustainability.

Healthcare quality

- Types of performance measures: process, outcome
- Sample performance measures for improved healthcare quality:
 - Rate of low-acuity ED visits (reducing inappropriate ED utilization)
 - Proportion of patients with weight screening and follow-up (increasing recommended and/or evidence-based healthcare interventions)
 - Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey (increasing patient satisfaction)
 - Proportion of urgent-visit patients seen the same day (increasing patient access)
- Sample performance measures for improved individual and population health:
 - HbA1C level (improved clinical outcomes)
 - Proportion of patients using tobacco (improved health behaviors)
 - SF-12 survey (better health-related quality of life)

Total cost of care

- Types of performance measures: process, outcome, efficiency
- Sample performance measures for medical expenditures:
 - Expenditures by cost category (inpatient care, outpatient care, etc.)
 - Proxy measures (e.g., measures of resource utilization)

It is vitally important for an MIHP program to calculate any savings generated by the program with respect to the total cost of care for a targeted population. Evidence of a program's impact on costs may be demonstrated by building a financial model

that explains the logic behind calculated savings. Improvements in the total cost of care may also be evidenced by net healthcare savings over a specific period of time or a reduction in medical costs.

Data collection

Data collection should take place from the start of an MIHP program's operational activities and continue as part of an ongoing process of program evaluation. Timely and accurate data collection is absolutely crucial to MIHP program evaluation. Performance measures should be analyzed on a regular basis and supported by an IT infrastructure that provides data analytics and electronic reporting. Whenever possible, the data collected should be incorporated into the electronic medical record in order to reduce the need for double entry.

In selecting what data to collect, an MIHP program should focus on discrete and reproducible information regarding program activities that are relevant to established performance measures. Meaningful data should also include elements that are patient-centric, reflecting both individual patient healthcare and overall community health. In addition, the data collected should include data points that are objective (for CHF patients, these may include medication compliance, weight maintenance, blood pressure control, rates of hospital readmission within 30 days and mortality), as well as subjective (such as patient satisfaction scores and patient willingness to comply with medical advice).

Program evaluation

The success of an MIHP program should ultimately be evaluated in terms of the Triple Aim set forth by the Institute for Healthcare Improvement: improving the individual experience of care (better healthcare), improving the health of populations (better health) and reducing the per-capita costs of care (lower costs).¹⁴

- 1. Better healthcare** An improved experience of care in the domains of safety, effectiveness,

patient-centeredness, timeliness, efficiency and equity. Performance measures should address elements such as patient satisfaction and experience, resource utilization, clinical quality and patient access.

- 2. Better health** An improvement in the overall health of a population. Performance measures should include metrics focused on both individual and population health.

- 3. Lower costs** A reduction in the total per-capita cost of healthcare. Performance measures should focus on the cost to the patient as well as the healthcare system.

The program evaluation process for an MIHP program should include the compilation of collected data into relevant performance measures, the benchmarking of results against established performance targets, and the use of effective reporting tools to provide a combination of patient-centered, payer-centered and community health-focused reporting. The conclusions drawn from the performance of an MIHP program will need to resonate with partially aligned yet still disparate groups of healthcare practitioners and stakeholders.

Once an MIHP program evaluation has been completed, the results should be made available to all program partners. Finally, in order for program evaluation to be truly effective, an MIHP program must ensure that a mechanism exists not only to review, but also to improve, the program's clinical care and operational performance.

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Glossary

Community paramedic "A state licensed EMS professional that has completed a formal internationally standardized Community Paramedic educational program through an accredited college or university and has demonstrated competence in the provision of health education, monitoring and services beyond the roles of traditional emergency care and transport, and in conjunction with medical direction. The specific roles and services are determined by community health needs and in collaboration with public health and medical direction." (Health Resources and Services Administration, 2012.)

Community paramedicine "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 addresses 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." (Health Resources and Services Administration, 2012.)

Interprofessional collaborative practice "When multiple health workers from different professional backgrounds work together with patients, families, caregivers and communities to deliver the highest quality of care." (World Health Organization, 2010.)

Interprofessional Intentionally defined and educated for team-based care.

Mobile Integrated Healthcare Needs-based, patient-centered, 24/7 acute care, chronic care and prevention services delivered in the home or mobile environment by the cost-effective synchronization of existing providers, infrastructure and resources in a system of care.

Mobile Integrated Healthcare Practice The interprofessional collaborative practice of Mobile Integrated Healthcare.

Multidisciplinary Work in parallel.

APPENDIX 2

MIHP Population Assessment and Program Planning Worksheet

Needs Assessment	
	Gather data and conduct qualitative research regarding community healthcare resources
	Determine stakeholders and establish a dialogue regarding community healthcare needs
	Identify target population
	Ascertain population healthcare needs
	Establish population-level healthcare goals (outcomes)
	Prioritize desired outcomes on the basis of level of need and available resources
	Create a “resource map” for the relevant population <ul style="list-style-type: none">• Capacity, assets, providers
	Identify gaps in population healthcare resources <ul style="list-style-type: none">• Existing services, providers, competency
	Evaluate feasibility of options for Mobile Integrated Healthcare Practice <ul style="list-style-type: none">• Financial sustainability• Regulatory and legal issues• Community receptiveness
Program Planning	
	Identify intended outputs
	Align program inputs with outputs
	Create a business plan
	Establish clinical leadership
	Formalize partnerships with stakeholders
	Establish performance measures and benchmarks
	Assess provider competencies
	Develop and implement provider education and training plan

Data Plan and Informatics Management	
	Establish system for collecting, analyzing and reporting relevant program data
	Regularly examine structure, process, outcome and efficiency measures
Decision Support	
	Develop processes for teleconsults and other online decision support
	Implement a comprehensive program for quality assurance/improvement
Safety Process Planning	
Care Planning and Management	
	Create a care plan template
	Develop processes for care management and coordination
	Develop evidence-based protocols for patient evaluation and treatment
Implementation Planning	
	Implement pilot program with established start and end dates <ul style="list-style-type: none"> • Real-time QI process • Transparent goals and performance measures • After-action review
	Plan for scalability
	Evaluate pilot program performance and re-launch
Program Evaluation	
	Evaluate operational performance
	Determine impact on healthcare outcomes
	Re-align program activities to promote program goals
Communications Planning	

APPENDIX 3

MIHP Program Profiles

The profiles included in this guide provide a sampling of various MIHP programs across the country; information was compiled through data submitted by each organization. For more examples, please visit MIHPresources.com.

MIHP Program Summary

AMR “PRIME Medic” CHF Readmission Reduction Program

LEAD ORGANIZATION/AGENCY:

American Medical Response

PROGRAM NAME:

AMR “PRIME Medic”CHF Readmission Reduction Program

LATEST UPDATE:

September 2014

LOCATION:

Arlington, Texas

FOR MORE INFORMATION:

Shane Smith, general manager, AMR Arlington
Buford.Smith@AMR.net

POPULATION SERVED:

Select patients discharged following treatment for CHF.

THE NEED:

Patients hospitalized for treatment of CHF have disappointingly frequent readmission rates. Improving patients’ connection to their post-discharge care plan can substantially reduce avoidable readmission arising from medication non-adherence, poor access to prescription drugs and failure to reconnect effectively with their primary care physician.

THE GOAL:

AMR’s PRIME Medics visit post-discharge CHF patients assigned by Arlington Memorial Hospital to facilitate reintegration into the home, confirm access to medications, review discharge instructions, ensure reconnection with their PCP,

monitor weight and blood pressure, and confer with the hospital sponsor about changes in patient condition.

MEDICAL OVERSIGHT:

AMR local medical director

PARTNERS:

AMR and Arlington Memorial Hospital

PERSONNEL:

AMR critical care paramedics

FUNDING:

Not disclosed

PLANS FOR SUSTAINABILITY:

Long-term plans include linking sustainable program funding to savings accruing to system payers from reduced readmission rates.

TECHNOLOGY USED:

None

PROGRAM RESULTS:

Of the more than 200 patients seen in this program, only 27 were readmitted following their involvement with the PRIME program, compared with 173 readmissions among the same patients prior to care by the PRIME program.

MIHP Program Summary

Hospital Readmission Reduction Project

LEAD ORGANIZATION/AGENCY:

AMR/Abbott EMS–St. Louis

PROGRAM NAME:

Hospital Readmission Reduction Project

LATEST UPDATE:

September 2014

LOCATION:

Barnes–Jewish Hospital at Washington University Medical Center, St. Louis, Mo.

FOR MORE INFORMATION:

Mark L. Corley, general manager
Mark.Corley@amr.net

POPULATION SERVED:

Elderly patients admitted for pneumonia, COPD, CHF or acute MI who are screened for high risk potential for readmission defined as having a LACE score of 10 or greater (PMCID: PMC 2845681) who do not qualify for, or refuse, home health services.

THE NEED:

Hospitals face growing scrutiny from payers and governmental oversight bodies regarding hospital readmission rates for key diagnoses. Abbott EMS recognized that it could play a vital role in assisting local hospitals with focused patient populations deemed at risk for hospital readmission but who refuse home health or do not qualify for home health visits.

THE GOAL:

To provide personalized and goal-directed care for patients who are discharged from the hospital with pneumonia, COPD, CHF or acute MI by working with hospital case management teams to specifically identify patient needs for disease education, outpatient clinic visits, transport planning, and empowerment for understanding and managing their chronic conditions to lessen their chances of acute exacerbations leading to readmission within 30 days.

MEDICAL OVERSIGHT:

The medical director for Abbott EMS, David K. Tan, MD, serves as the program's medical director. Rob Hackleman, a Stay Healthy Outpatient Program (SHOP) social worker, leads the hospital screening process and is involved in patient selection and operational quality assurance and quality improvement, giving direct feedback to the medical director. Protocol checklists and patient feedback go directly to SHOP and the patient's chart.

PARTNERS:

Barnes–Jewish Hospital, Stay Healthy Outpatient Clinic

PERSONNEL:

Six advanced practice paramedics

FUNDING:

This pilot program is a shared risk model between Abbott EMS and Barnes–Jewish Hospital. Future funding will depend largely on the overall success of the program, in addition to value-added benefits realized by both parties.

PLANS FOR SUSTAINABILITY:

Develop a sustainable fee structure using demonstrated cost savings to the hospital.

TECHNOLOGY USED:

The CAD system in our current infrastructure is able to keep track of resources sent to the enrolled patients who are flagged in the system as part of the Hospital Readmission Reduction Project. The patients are also given a special number to call 24 hours a day, seven days a week should they feel the need to discuss a problem with their assigned primary care paramedic. The number is identifiable by the dispatcher that the caller is part of this program.

PROGRAM RESULTS:

This pilot program has a goal of 100 patients to enroll for data analysis. Currently, 24 patients have been enrolled.

MIHP Program Summary

Ventura Tuberculosis Directly Observed Therapy Project

LEAD ORGANIZATION/AGENCY:

Ventura County Health Agency/American Medical Response/Gold Coast Paramedics

PROGRAM NAME:

Ventura Tuberculosis Directly Observed Therapy Project

LATEST UPDATE:

September 2014

LOCATION:

Ventura County, Calif.

FOR MORE INFORMATION:

Mike Taigman, general manager,
AMR Ventura/Gold Coast Paramedics
Mike.Taigman@AMR.net

POPULATION SERVED:

Patients requiring daily medication for active TB

THE NEED:

Successful treatment of TB requires strict adherence to a daily medication regimen. Many of these medications have significant side effects. Directly observed therapy (DOT) is the most effective process for supporting adherence and for providing a supportive relationship with these patients. This patient population has a high percentage of people who are marginally housed or economically disadvantaged, or who lack citizenship documentation. All patients in the project are seen daily in the community by consistently assigned AMR and Gold Coast paramedic supervisors, provided with their medications and assessed for signs of malabsorption or side effects.

THE GOAL:

Improve adherence to daily medication regimen for patients with TB in Ventura County and manage side effects/complications quickly and effectively.

MEDICAL OVERSIGHT:

County health agency and AMR local medical director

PARTNERS:

AMR Ventura, Gold Coast Paramedics and Ventura County Health Agency

PERSONNEL:

AMR paramedic supervisors

FUNDING:

Not disclosed

PLANS FOR SUSTAINABILITY:

Program currently meets the needs of all identified patients.

TECHNOLOGY USED:

None

PROGRAM RESULTS:

The AMR MIH staff consistently DOT more than 90 percent of patients in daily census.

MIHP Program Summary

Hospice Revocation Avoidance

LEAD ORGANIZATION/AGENCY:

MedStar Mobile Healthcare

PROGRAM NAME:

Hospice Revocation Avoidance

LATEST UPDATE:

September 2014

LOCATION:

Fort Worth and 14 suburban cities in north Texas

FOR MORE INFORMATION:

Matt Zavadsky, director of Healthcare & Community Integration
MZavadsky@medstar911.org

POPULATION SERVED:

Patients/families at risk for voluntary disenrollment in hospice. A total of 142 patients have been enrolled to date.

THE NEED:

Many patients/families call 911 at the last moment in panic for a hospice patient. This often results in an ambulance trip to the ED and potential disenrollment in hospice.

THE GOAL:

- Improve the patient's experience of care, including outcome
- Improve population health
- Reduce the cost of care
- Help the patient transition to desired state in the safety and security of home, without an unnecessary ED trip or revocation of hospice status

MEDICAL OVERSIGHT:

The hospice agency medical director (delegated by the EMS medical director); in absence of this, the EMS medical director.

PARTNERS:

VITAS Innovative Hospice

PERSONNEL:

Specially trained mobile healthcare practitioners and critical care paramedics; RN for case management

FUNDING:

Per enrolled patient/per month fee

PLANS FOR SUSTAINABILITY:

Fee for enrollment (per enrolled patient/per month referring sources)

TECHNOLOGY USED:

SharePoint EMR

PROGRAM RESULTS:

Approximately 92 percent reduction of hospice revocation/voluntary disenrollment of enrolled patients.

MIHP Program Summary Home Health Partnership

LEAD ORGANIZATION/AGENCY:

MedStar Mobile Healthcare

PROGRAM NAME:

Home Health Partnership

LATEST UPDATE:

September 2014

LOCATION:

Fort Worth and 14 suburban cities in north Texas

FOR MORE INFORMATION:

Matt Zavadsky, director of Healthcare & Community Integration
MZavadsky@medstar911.org

POPULATION SERVED:

Patients on home health service at risk for a 911 call; patients on home health service who require after-hours visits.

THE NEED:

- Some home health-enrolled patients call 911 without the knowledge of the home health agency for care coordination
- Home health agencies are held accountable for ED visits/admissions by referring hospital
- After-hours calls for a home RN visit are expensive to the home health agency

THE GOAL:

- Improve the patient's experience of care, including outcome
- Improve population health
- Reduce the cost of care
- Coordinate care with the home health nurse knowledgeable about the patient's needs
- Avoid unnecessary ED visits
- Avoid unnecessary home health nurse visits

MEDICAL OVERSIGHT:

The home health agency medical director (delegated by the EMS medical director); in the absence of this, the EMS medical director

PARTNERS:

Klarus Home Care

PERSONNEL:

Specially trained mobile healthcare practitioners and critical care paramedics; RN for case management

FUNDING:

Patient contact fee

PLANS FOR SUSTAINABILITY:

Fee for contact

TECHNOLOGY USED:

SharePoint EMR; Kinser Home Health EMR (we log in to this)

PROGRAM RESULTS:

28 patient contacts; reduced ED visits in enrolled population by 36 percent

MIHP Program Summary

EMS Loyalty Program

LEAD ORGANIZATION/AGENCY:

MedStar Mobile Healthcare

PROGRAM NAME:

EMS Loyalty Program

LATEST UPDATE:

September 2014

LOCATION:

Fort Worth and 14 suburban cities in north Texas

FOR MORE INFORMATION:

Matt Zavadsky, director of Healthcare & Community Integration
MZavadsky@medstar911.org

POPULATION SERVED:

Patients who call 911 15 or more times in 90 days; or patients referred by agencies (hospitals, first responders, payers) that believe these patients would benefit from intervention. A total of 390 patients have been enrolled to date.

THE NEED:

Patient education on better ways to manage medical issues and navigation to resources other than an ED or EMS agency that can better serve as a patient-centered medical home.

THE GOAL:

- Improve the patient's experience of care, including outcome
- Improve population health
- Reduce the cost of care
- Educate on ways to better manage medical needs
- Connect with resources necessary to reduce 911 and/or ED use
- Reduce 911 and ED use

MEDICAL OVERSIGHT:

The patient's assigned primary care physician (delegated practice); in absence of this, the EMS medical director.

PARTNERS:

- Medical Control Authority (Emergency Physician's Advisory Board)
- John Peter Smith Health Network
- Texas Health Resources
- HCA–Plaza Medical Center
- Baylor Scott & White–Fort Worth
- Tarrant County Mental Health/Mental Retardation Agency
- United Way
- Area Agency on Aging
- Catholic Charities
- Resource Recovery Council
- Perrone Pharmacy
- Tarrant County Homeless Coalition
- Tarrant County Public Health
- Day Resource Center
- Care Now Medical Clinics
- Concentra Medical Clinics
- Federally Qualified Health Center

PERSONNEL:

Specially trained mobile healthcare practitioners and critical care paramedics; RN for case management

FUNDING:

Outside referrals; fee for enrollment

PLANS FOR SUSTAINABILITY:

Continued fees for enrollment (hospitals and other referring sources); move to capitated arrangement for payers (Cigna–HealthSpring, Amerigroup, Silverback Care Management, etc.).

TECHNOLOGY USED:

Standard ALS medical equipment; digital scale; IStat point of care testing; SharePoint EMR. Also testing several telemedicine and telemonitoring platforms.

PROGRAM RESULTS:

- Approximately 29 percent reduction in ED/EMS use during enrollment
- Approximately 82 percent reduction in ED/EMS use post-graduation

APPENDIX 4

Resources

Books

- Institute of Medicine: *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, D.C.: National Academy Press.

Journal Articles

- Munjal K, Carr B: Realigning reimbursement policy and financial incentives to support patient-centered out-of-hospital care. *Journal of the American Medical Association*, 309(7):667-668, 2013.
- Berwick DM, Thomas W, Nolan TW, Whittington J: The Triple Aim: care, health, and cost. *Health Affairs*, 27(3): 759-769, 2008.

Web Resources

- U.S. Department of Health and Human Services Health Resources and Services Administration, Office of Rural Health Policy Community Paramedicine Evaluation Tool: hrsa.gov/ruralhealth/pdf/paramedievaltool.pdf.
- Mobile Integrated Healthcare Practice Collaborative: mobileintegratedhealthcare.com.
- Full text of the Patient Protection and Affordable Care Act (H.R. 3590): gpo.gov/fdsys/pkg/BILLS-111hr3590enr/pdf/BILLS-111hr3590enr.pdf.
- Watkins R, Meirs M, Visser Y: A guide to assessing needs: essential tools for collecting information, making decisions and achieving development results. The World Bank, 2012. Free PDF: needsassessment.org.
- Association of Community Health Improvement, Community Health Assessment Toolkit: assesstoolkit.org.
- The National Association of County & City Health Officials: Mobilizing for Action Through Planning and Partnerships (MAPP): naccho.org/topics/infrastructure/mapp/.
- Centers for Disease Control and Prevention: Community Health Assessment and Group Evaluation (CHANGE) Action Guide: Building a Foundation of Knowledge to Prioritize Community Needs: cdc.gov/healthycommunitiesprogram/tools/change/pdf/changeactionguide.pdf.

- U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion: Healthy People 2020: [healthypeople.gov](http://www.healthypeople.gov).
- Core Measurement Needs for Better Care, Better Health, and Lower Costs: Counting What Counts: Workshop Summary. Healthcare quality and its affordability have become pressing issues in the United States. All sectors of the country are attempting to push forward initiatives that will improve the healthcare system as well as the health of the patient. Available at nap.edu.

Other Resources

- Community-Based Needs Assessment: Assisting Communities in Building a Stronger EMS System. U.S. Department of Health and Human Services Health Resources and Services Administration Office of Rural Health Policy, 2009.
- Leadership commitments to improve value in Health Care. Finding Common Ground: Workshop Summary. Institute of Medicine

(US) Roundtable of Evidence-Based Medicine. Washington, D.C.: National Academies Press; 2009 ISBN-13: 978-0-309-11053-2 ISBN-10: 0-309-11053-X. This volume relates discussions among multiple stakeholders regarding methods for transforming healthcare in the United States. The U.S. healthcare system consists of a complex network of decentralized and loosely associated organizations, services, relationships and participants. Each of the healthcare system's component sectors—patients, healthcare professionals, healthcare delivery organizations, healthcare product developers, clinical investigators and evaluators, regulators, insurers, employers and employees, and individuals involved in information technology—conducts activities that support a common goal: to improve patient health and well-being. Implicit in this goal is the commitment of each stakeholder group to contribute to the evidence base for healthcare—that is, to assist with the development and application of information about the efficacy, safety, effectiveness, value and appropriateness of the healthcare delivered.

APPENDIX 5

A Unique Organization: The American Telemedicine Association

Located in Washington, D.C., the American Telemedicine Association (ATA) is the leading resource for telemedicine information in the U.S. and offers useful resources for the public.

ATA describes its guidelines as such: "ATA's practice guidelines for telemedicine are the critical foundation for the deployment of telemedicine services. Standards form the basis for uniform, quality patient care and safety, grounded in empirical research and clinical experience. The establishment of such standards also accelerates the adoption of telemedicine by payers, administrators and providers who are full partners with ATA in their development along with industry, government agencies, medical societies and other stakeholders."

American Telemedicine Association standards and guidelines

On the ATA website (americantelemed.org) there are lists of, and links to, standards and guidelines relating to various aspects of telemedicine released from 1999 to the present, as well as a list of guidelines scheduled for completion in the next one to two years. These include remote healthcare data management, remote prescribing and urgent primary care. These are available for download at no cost.

Other resources available on the site include a list of up-to-date state information on private and Medicaid telemedicine implementation, as well as proposed legislation on telemedicine bills pertaining to coverage and access. A glossary of telemedicine nomenclature is also provided, which provides clear definitions for many potentially confusing concepts.

Below is a sample of publications available on the website.

- A Lexicon of Assessment and Outcome Measures for Telemental Health** Published in November 2013, this lexicon is a research tool developed to aid telemental health professionals in the selection of assessment and outcome measures. This resource will help increase understanding in the field, allow for broader comparisons and support better generalization of findings.

- Practice Guidelines for Video-Based Online Mental Health Services** Published in May 2013, these guidelines cover the provision of mental health services when using real-time videoconferencing services transmitted via the Internet, including a personal computer with a webcam or a mobile communications device (e.g., "smart

phone,” laptop or tablet) with two-way camera capability.

- **Expert Consensus Recommendations for Videoconferencing-Based Telepresenting**

Published in October 2011, this consensus includes administrative, technical and clinical standards for health professionals using videoconferencing-based telepresenting to connect patients with remote medical providers.

- **A Blueprint for Telerehabilitation Guidelines**

Published in October 2010, these guidelines feature the key administrative, clinical, technical and ethical principles that should be considered in the course of providing telerehabilitation services. They are based primarily on the American Telemedicine Association’s Core Standards for Telemedicine Operations and describe additional considerations that are present across applications within telerehabilitation and its related fields.

- **Practice Guidelines for Videoconferencing-Based Telemental Health**

Published in October 2009, these guidelines aim to assist in the development and practice of coherent, effective, safe and sustainable telemental health practices. The guidelines focus

on telemental health services delivered through two-way, interactive (synchronous) videoconferencing.

- **Evidence-Based Practice for Telemental Health**

Published in July 2009, this document is a companion piece to ATA’s Practice Guidelines for Videoconferencing-Based Telemental Health, with reference and support for decision-making in developing and providing telemental health services.

- **Core Standards for Telemedicine Operations**

Published in February 2008, these are fundamental requirements to be followed in providing remote medical services, interactive patient encounters and any other electronic communications between patients and practitioners for the purposes of healthcare delivery. Administrative, clinical and technical aspects are addressed.

- **Home Telehealth Clinical Guidelines**

Published in 2003, these guidelines encompass the diverse applications for home telehealth technology and establish a set of universal principles guiding the development and deployment of home telehealth in the future.



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