

SPECIAL REPORT

Transforming Quality in EMS

HOW QUALITY OF CARE IN HEALTHCARE AND EMS DRIVES CLINICAL IMPROVEMENT —
AND OPERATIONAL AND FINANCIAL SUCCESS

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Every Record. In Real Time. Automatically.

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Healthcare is moving to quality measurement, bringing with it improved patient care—and financial implications. Simply stated, the components of the Affordable Care Act are directly related to controlling cost through a focus on quality of care.

Section II **The imperative to measure clinical and operational quality in EMS**

The same quality measures that are driving change in healthcare described in Section I will soon be coming to EMS. Progressive EMS agencies are monitoring, measuring and managing quality to improve patient care and ensure success when financial incentives become realities. In this section, we will describe how quality improvement has evolved in EMS, and why many agencies struggle with implementing a quality program.

Section III **How FirstWatch supports quality care and operations in EMS**

Based on validated science and standards, and in conjunction with local EMS protocols, FirstWatch has developed EMS quality metrics and measures that are essential for high performing EMS systems. Using unique software applications and information flow designs, FirstWatch leverages data from Computer Aided Dispatch (CAD), Electronic Patient Care Records (ePCR) and hospital data to capture and analyze data in real time, giving managers actionable information to improve quality in operations and patient care.

SECTION I

How healthcare is investing in quality

“Quality is everyone’s responsibility” – *W. Edwards Deming*

Quality Improvement was born out of the fields of engineering with the institution of metrics, statistical process controls and other methods to eliminate error. The motivation was to improve production, which would translate to better quality and cost efficiencies that would in turn improve profits.

Healthcare, on the other hand, has historically used a model of being paid for performing services to patients rather than improving the care of the patient. In the past, there was little incentive for making the delivery of healthcare more efficient, eliminate errors or develop quality control processes. Indeed, most of the time services and interventions were “best efforts” and discrete events that focused on simplistic outcomes rather than measured against definable standards with validated measures to improve outcomes. There was little discussion on eliminating error or developing quality “systems.” This “system” was enabled by a market opting to pay for services with little attention paid to value, particularly quality or efficient care.

In this legacy model, there is no incentive to improve patient care. A hospital that invests in quality, providing top-notch care on a cardiac patient will receive the same reimbursement (and possibly more) than another hospital that provides inferior care. In no other industry is this acceptable as a model for the delivery of services.

This model is not sustainable and partially explains why the U.S. healthcare system is the most expensive in the world, accounting for 17% of the gross domestic product with some of the poorest outcome measures among industrialized countries.

EMS exists now where healthcare was before the Patient Protection and Affordable Care Act (ACA)—with reimbursement for providing a service (transport) rather than quality. And just as the cost of healthcare overall has skyrocketed, so has the cost of EMS. A recent report by the Health and Human Services (HHS) Office of the Inspector General details how the cost of providing EMS care to Medicare recipients has grown exponentially and far faster than the overall cost of providing medical care. This, as well, is an unsustainable model.

This has led us to a new environment in healthcare—with new regulations, legislation, policies and ways of thinking.

This move to quality in healthcare is based in part on the Institute for Healthcare Improvement’s (IHI) Triple Aim that “describes an approach to optimizing health system performance.” The three dimensions, which comprise the Triple Aim, are:

- Improving the patient experience of care (including quality and satisfaction)
- Improving the health of populations
- Reducing the per capita cost of healthcare

FIGURE 1: THE “OLD” FINANCIAL MODEL

Admit Patient to Hospital > Provide Services > Bill for Services

FIGURE 2: THE IHI TRIPLE AIM



Source: www.ihl.org

Many healthcare organizations are adopting the Triple Aim framework as the basis for improving care, including the Centers for Medicare and Medicaid Services (CMS). Using this framework, the federal government has developed several programs with the goal to bend the cost curve by improving care. This will more than likely also be the future for EMS.

LESSONS THAT "OUT OF HOSPITAL" PROVIDERS CAN LEARN FROM "IN HOSPITAL"

With the implementation of the ACA, the federal government has now begun to place value on quality instead of quantity. The new focus is on "systems of care" and measuring performance. Major programs under the CMS have put quality in the front seat, with an emphasis on pay-for-performance and pay-for-measurement. The associated quality metrics will become increasingly standardized and required. The result is that hospitals and other healthcare organizations are now being paid—or penalized—based on the quality of care.

MEASURING QUALITY

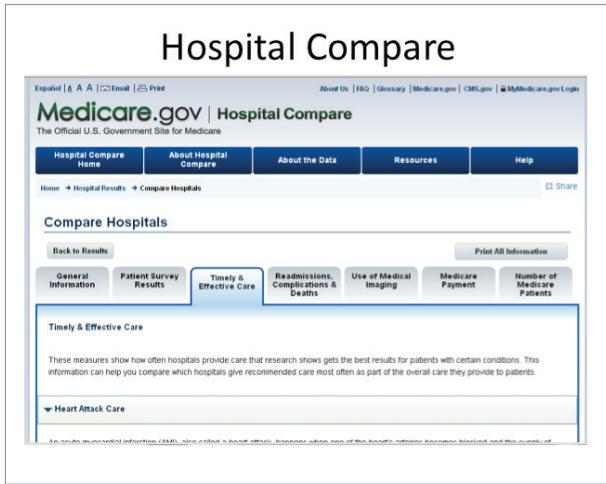
The **Hospital Inpatient Quality Reporting (IQR)** program is an excellent example of how the government is leveraging common data elements to give an assessment of the industry. This is very common in other industries, but is now finding acceptance in healthcare.

The Hospital IQR Program was developed as a result of the Medicare Prescription Drug, Improvement and Modernization Act (MMA) of 2003 and then adjusted with the Deficit Reduction Act (DRA) of 2005.

The Hospital IQR Program is intended to equip consumers with quality of care information to make more informed decisions about healthcare options. It is also intended to encourage hospitals and clinicians to improve the quality of inpatient care provided to all patients. The Hospital IQR Program currently tracks 72 quality measures that include everything from immunizations to treatment of heart attacks.

To help consumers make intelligent choices regarding the purchase of healthcare and to improve transparency, many of the Hospital IQR program measures are published on the **Hospital Compare** website (<http://www.hospitalcompare.hhs.gov/>). According to CMS.gov, Hospital Compare "is a consumer-oriented website that provides information on how well hospitals provide recommended care to their patients. This information can help consumers make informed decisions about healthcare. Hospital Compare allows consumers to select multiple hospitals and directly compare performance measure information related to heart attack, heart failure, pneumonia, surgery and other conditions."

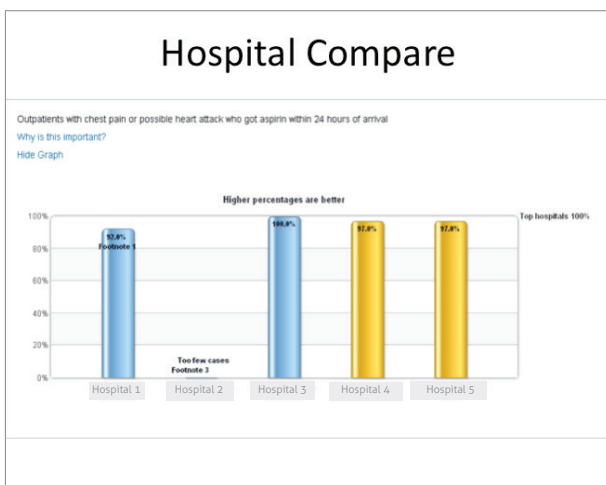
FIGURE 3: HOSPITAL COMPARE WEBSITE



1



2



3

HOSPITAL COMPARE

Key Concepts

- **Screenshot 1** shows that Hospital Compare uses several measures to grade hospitals, with definitions for each.
- **Screenshot 2** compares regional hospitals on the “average number of minutes before outpatients with chest pain or heart attack got an ECG.” Note a comparison to state and national averages for reporting hospitals is included.
- **Screenshot 3** compares the same hospitals on “outpatients with chest pain or possible heart attack who got aspirin within 24 hours of arrival.”

The results on Hospital Compare are organized by:

- Patient Survey Results
- Timely and Effective Care
- Readmissions, Complications and Deaths
- Use of Medical Imaging
- Linking Quality to Payment
- Medicare Volume

These measures allow the consumer to directly view performance of key indicators across geographic areas as well as how a hospital compares to national and state averages.

Originally a voluntary program as part of IQR, Medicare now requires CMS to adjust payments to hospitals that do not participate by reducing their applicable reimbursement percentage by 2%. Since implementation of the financial penalty, hospital participation has increased to more than 99% of Medicare-participating hospitals.

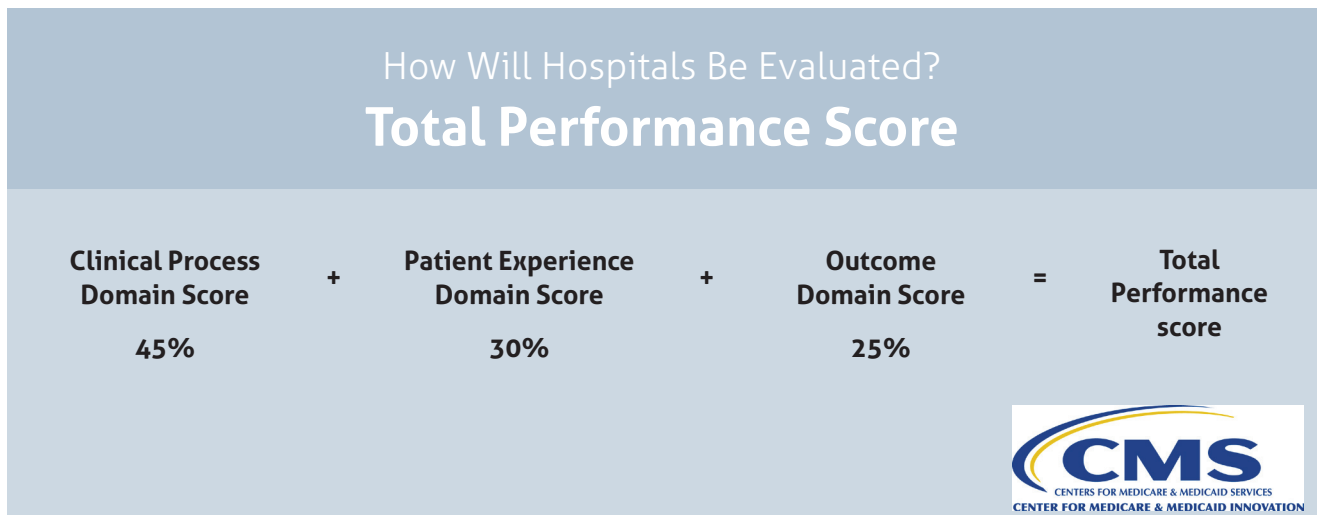
The **Hospital Value-Based Purchasing (VBP)** program uses the data supplied by the IQR in an effort to improve the quality of care. This program is intended to transform Medicare from a passive payer for services to a prudent purchaser of services, paying not just for quantity of services but for quality care as well.

According to CMS.gov, the VBP program is "...for hospitals, clinicians, and other stakeholders who share CMS' commitment to transforming the quality of hospital care by realigning hospitals' financial incentives to do so."

The VBP program can now set benchmarks and provide incentives to hospitals to reach these benchmarks as well as penalize those that are poor performers.

The formulas are complex; however, they are based on simple to understand domains including Clinical Process of Care, Patient Experience and Mortality.

FIGURE 4: HOSPITAL PERFORMANCE MEASURES



CLINICAL PROCESS OF CARE DOMAIN

The Clinical Process of Care Domain, also known as measures of timely and effective care, measure how often patients receive appropriate care known to offer the best results. These include measures such as getting a patient having a heart attack from the emergency department to the cardiac catheterization lab within 90 minutes.

PATIENT EXPERIENCE OF CARE DOMAIN

The Patient Experience of Care Domain uses a national, standardized survey that asks adult patients about their experiences during a recent hospital stay. This includes measures such as how well the doctor or nurse communicated to the patient as well as cleanliness of the hospital environment and pain management.

MORTALITY

Added in 2014 is a measure of 30-day mortality for patients suffering from heart attacks, congestive heart failure and pneumonia. These are important markers for the delivery of quality of care.

Based on the quality of care, the quality of experience and mortality measurements, hospitals face the prospect of increased revenue for quality care and patient experience—or a decrease in reimbursement if care is delivered poorly.

THE PUSH FOR QUALITY

In totality, this results in a newfound push for quality in healthcare organizations and hospitals. The aim is to provide better patient care, better manage costs, reward excellence and penalize underperformance.

So how does this push for quality affect EMS?

EMS, unfortunately, has few metrics to measure itself by to show value or quality. Currently, there are no universally agreed upon metrics for the EMS industry to benchmark against. However, it is imperative that EMS move quickly in the direction of metrics, measurement and quality.

SECTION II

The imperative to measure clinical and operational quality in EMS

Up to this point, EMS has been largely missed in the evolution and emphasis on quality in healthcare. Although quality has been discussed, and is being addressed in some pockets by forward-thinking EMS leaders and agencies, governmental organizations have placed little emphasis on driving EMS systems to improve quality. This is reflected in how Medicare has traditionally paid for service by EMS providers, which is based on the transport of the beneficiary instead of the quality or care delivered to the patient, or outcomes. This is similar to the way healthcare was purchased before the reforms of the ACA.

In other areas of healthcare, there are established quality measures that are defined by Health and Human Services (HHS), including the National Quality Foundation (NQF) or the Agency for Healthcare Research and Quality (AHRQ). This is not the case in EMS, where there are few established metrics for quality of care for the out-of-hospital patient. Enormous variations in the quality of EMS systems exist.

QUALITY VARIATIONS: THE CARDIAC ARREST EXAMPLE

Though cardiac arrest patients make up only 1-2% of the EMS patient population, there is no question that the quality of care delivered by EMS providers directly

affects whether a patient will survive. This population of patients could also reasonably be seen as a valid sample of all patients within the system—and thus as a surrogate marker for quality.

Most EMS providers are trained to a common standard in the care of cardiac arrest, so presumably there should be minimal bias in level of training. Though some component of survival is dependent upon in-hospital care, the return of spontaneous circulation in the field is a high predictor of survival and is largely dependent upon EMS and the community.

Cardiac arrest survival using Utstein criteria (a set of guidelines for uniform reporting of cardiac arrest), ranges from near 0% to 50% across the country. It is therefore logical to state that the largest influence on survival from this medical condition is a high quality EMS system.

Cardiac Arrest is a prime example of how quality will be assessed by governmental organizations, and result in either financial incentive for excellence or penalties for underperformance.

FIGURE 5: CARDIAC ARREST METRICS/MEASUREMENT

Cardiac arrest, like many other clinical conditions, has very clear metrics and measurement:

METRIC	MEASUREMENT/EVIDENCE
Return of Spontaneous Circulation	% of Patients with ROSC Using Utstein Criteria
Survival to Hospital Discharge	% of Patients with DC Using Utstein Criteria
Neurological Status of Survivors	% of Patients with Neuro Intact Using Neuro Functional Status

SIMILARITIES TO THE “INPATIENT” SIDE

Just as the quality programs outlined in Section I are taking hold in healthcare and hospitals, there will likely soon be an expectation that EMS care—and reimbursement—will be based on quality. Many of the measurements used on the inpatient side of care are directly applicable to the out-of-hospital environment including things such as:

- The time it takes to perform an ECG on a chest pain patient
- Measurement of the time it takes for a heart attack patient to get from the scene to the cardiac catheterization lab

Beyond the clinical care domains, in most systems patient experience is not routinely measured for the out-of-hospital patient. However, it would not be difficult to translate the inpatient measures to the out-of-hospital patient by asking such things as

- Was your pain relieved?
- Did the paramedic communicate with you?
- How clean was the ambulance?

These are important measures to look at to make sure that EMS is delivering value to the community.

As a result, progressive EMS agencies are putting practices and technology in place to ensure quality of care is measured, while at the same time managing costs.

BENEFITS OF MEASURING QUALITY IN EMS

EMS has some distinct advantages and some challenges when it comes to measuring its value and quality of care.

EMS is a perfect laboratory for looking at quality. By and large, EMS controls the delivery of emergency care and transport for entire populations and geographic areas with limited or no competition. This is good and bad for different reasons. It is good because it means the delivery of this care can be centralized and organized. It is measured on multiple platforms from the time to delivery of care to centralized record keeping. All the healthcare providers are trained to a certain level and follow common protocols. As a result, it is more straightforward to develop quality control measures and to impact the delivery of care because it is an organized “system.” The same cannot be said about the rest of healthcare. At the same time, EMS is a poor model because there is less competition, resulting in diminished innovation. With no market pressure, there is a failure to invest in improving the “system” and measuring quality.

In almost all EMS systems, data to measure quality is bountiful—in ePCR, CAD and other tools, platforms and systems. What’s key is capturing that data, and then measuring it. The reality is that this can be done without changing any of the systems already in place in an EMS agency. In the next section, we’ll discuss options and opportunities to capture, measure and report this data.

Systems that understand the need to improve efficiencies and demonstrate value are investing in data analytics and information to improve the quality of care delivered to the populations they serve. They are well positioned for the EMS of the future.

SECTION III

How FirstWatch supports quality care and operations in EMS



North Shore Long Island (NY) Jewish Health System uses FirstWatch to monitor key performance indicators and ensure clinical and operational quality.

The traditional approach to Quality Improvement in EMS is labor intensive, time consuming and often confusing, leaving little time to actually improve care. EMS agencies need the ability to monitor and analyze patient care data, identifying deviations rapidly, consistently and automatically.

These tasks used to take days or weeks, involving stacks of records, multiple data entry procedures and reports that were always a month late. With the advent of electronic data capture, data can now be collected in minutes and reviewed quickly and without data loss due to entry errors. The same capabilities that allow EMS to be so well-positioned with regard to quality improvement also allow data to be collected and reviewed in a much more timely fashion than traditional medicine. Within minutes, the entire patient experience can be reviewed from the time 911 is called to delivery at the hospital.

Most importantly, quality improvement managers can now focus on actually improving the delivery of EMS rather than the collection, entry and analysis of data. Beyond these clinical aspects, improving the quality, collection and analysis of data improves billing and financial recovery.

More than 300 agencies across the U.S. and Canada use FirstWatch to monitor real-time 911 and EMS patient data for early detection, situational awareness, enhanced operations—and improved clinical care. Those agencies started down this path to improve organizational effectiveness and clinical care, and they are now positioned well for the future of EMS reimbursement.

FirstWatch uses automated EMS-centric reporting and real-time, web-based data visualization tools. User-defined data filters called “triggers” help monitor the agency’s performance against defined operational and clinical objectives. Real-time data is displayed in dashboards and can be accessed on any device connected to the internet.

KEY FIRSTWATCH FEATURES FOR EMS INCLUDE:

- **A variety of data sources** — Any information that is captured in a database (e.g., CAD, ProQA, ePCR, RMS, hospital data) can be monitored by FirstWatch. The process is automated with no need for new training or any changes in how staff currently works.
- **Improved operational performance** — FirstWatch monitors key performance indicators (KPIs) in real time, such as response times, scene times and hospital drop-offs.
- **Improved clinical performance**—FirstWatch provides automated, real-time feedback on adherence to patient care protocols, enabling more effective quality improvement programs.
- **Dashboards make data easy to visualize** — KPIs are presented on dashboards so users can quickly and easily see the status of any dataset they wish to see—and on any device that connects to the Internet.

- **Early warning utility** — At the same time it's monitoring KPIs and helping improve clinical outcomes, FirstWatch can be set to alert for early signs of a chemical, biologic, radioactive or nuclear attack, or for naturally occurring epidemics or pandemics.
- **Sentinel event/situational awareness alerts** — FirstWatch can be used to reduce workload and increase awareness by automating key notifications for sentinel or situational awareness events, for example: reports of a suspicious package found at or near a high threat facility, STEMI, stroke, cardiac arrest, hazmat or MCI events to name a few.
- **Customized alerting** — Users determine to whom and how an alert will automatically be sent—for example, pager, email, fax, text message, etc.
- **Pre-set or customized triggers** — Users can use pre-set triggers to provide alerts for common types of incidents, and can also have customized triggers for their specific needs.
- **Secure processes meet HIPAA requirements** — FirstWatch systems and processes ensure security, meeting or exceeding all HIPAA requirements.



The FirstWatch App offers real-time EMS performance, operational and clinical compliance data for iPad or Android tablet. A version for iPhone and Android phones is coming soon.

FIRSTPASS OVERVIEW

FirstPass, created by FirstWatch, is a clinical measurement and protocol monitoring tool designed to alert users to deviations in expected treatments to medical protocols. FirstPass provides continuous monitoring of ePCR and other data to quickly identify and provide real-time alerts related to protocol deviations, incomplete “care bundles” (which include scientifically validated patient care protocols), missing data elements or urgent patient safety issues. A standard bundle of protocols are designed to

measure predefined quality metrics for STEMI, stroke, trauma, cardiac arrest and airway management patients. The protocols are configured with quality metrics, yet the agency has the ability to add metrics specific to their agency or locality.

The following are quality system standards that are being used by some progressive EMS agencies. These quality measures can be readily reviewed using existing data sources, including ePCR, CAD, hospital data and other software and platforms.

The quality metrics are segmented into the following components:

1. **System Performance Measures:** These are indicators that are common measures across EMS systems and are readily comparable among systems. Examples include response times and cardiac arrest survival.
2. **Clinical Performance Measures:** These evidence-based clinical measures have been endorsed or are emerging as best practices and have shown value to the patient population when performed correctly. An example of this would be ST segment elevated myocardial infarction (STEMI).
3. **Patient Safety/Risk Reduction Performance Measures:** These are evidence-based and best practice measures that reduce the patient’s risk of preventable harm as well as reduce risk to the system as a whole. Examples of this include airway management and narcotics management.
4. **Financial Performance Measures:** How efficient is the system as a whole? Considerations include unit hour utilization, billing cycle, penalties, cost per capita, billing information completeness, etc.

SUMMARY

EMS organizations need to be monitoring, capturing and measuring data continuously and in near real-time to ensure quality patient care and ensure optimum clinical and operational performance. Previously, this required exhaustive staff time and efforts, cobbling data together manually from various sources.

But in today’s environment, with financial incentives and penalties looming for EMS, there’s even more of an imperative to focus on quality. FirstWatch helps agencies take this information-driven approach to EMS seamlessly.



Alexander Garza, MD, MPH

Alexander Garza, MD, MPH, serves as medical director of FirstWatch and is a noted homeland security advisor. Dr. Garza is an important liaison to the public health and safety communities, using his unique perspective to understand challenges and develop innovative solutions. "I believe in the power of data to improve systems," he says, "and I've always enjoyed working with public health and safety communities."

Dr. Garza's career has centered on the delivery of emergency care, public health and security. He became an EMT in 1986 and has gradually worked in every level of providing care and leadership in emergency medicine. This included working as a paramedic, a flight medic, emergency physician, an Army officer in combat theater and an EMS administrator at the municipal and state level. In the immediate past he served as assistant secretary for health affairs and chief medical officer of the Department of Homeland Security.

He has written extensively on issues involving EMS and security. He is considered an expert in weapons of mass destruction, health diplomacy in the U.S. Army Civil Affairs community, health threats to national security and strategic and operational excellence. He has lectured nationally and internationally on health and security topics as well as the delivery of care to out-of-hospital patients and has counseled leadership at the highest levels of government.

Additionally, Dr. Garza serves as an associate dean for public health practice and associate professor of epidemiology at Saint Louis University's College for Public Health and Social Justice. There he teaches, learns and engages in research with faculty and students in the areas of emergency management, public health preparedness and epidemiology. "Through my work at SLU I hope to bring real-world strategies to the classroom as an example for better merging the worlds of academia, public health and safety." Dr. Garza resides in St. Louis, Missouri, with his wife, Melissa, and three very active boys.

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