

**IDPH
EMS STRATEGIC PLAN
2018 Revision**

**EDUCATION and
QUALITY Management
sections**

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EXTERNAL FORCES IMPACTING OUR PLANNING

History, national statutes, standards, guidelines, models

Before 1970, EMS in the United States was inconsistent and fragmented. There was no standardized education or credentialing of EMS providers beyond basic first aid and ambulances were designed without standards. There were no systems in place to coordinate the care and transport of the sick and injured. To use a computer software analogy, you might say we were operating in Version 1.0 of EMS (Robins, 2017).

The modern era of EMS began in 1966 with the publication of the landmark white paper "Accidental Death and Disability: The Neglected Disease of Modern Society" from the National Research Council of the National Academy of Sciences. That same year, the Highway Safety Act (Public Law 89-564) was passed to reduce the number of fatalities and injuries that occur on U.S. roads and highways. Subsequent to this paper, we started to use the term "EMS," established standards of training for EMTs and paramedics, created design criteria for ambulances and talked about "systems" for delivering service rapidly and consistently (Robbins, 2017).

Fast forward to August, 1996: The National Highway Traffic Safety Administration (NHTSA) and the Health Resources and Services Administration (HRSA) Maternal and Child Health Bureau, published the **Emergency Medical Services Agenda for the Future**. The "AGENDA" was a consensus document created, endorsed, and embraced by the national EMS community through a Steering Committee and a Blue Ribbon Conference. It examined the previous three decades of EMS, capsulated the state of EMS in 1996, and looked ahead to create a vision for the future. The authors designed it to be used by government and private organizations at the national, state, and local levels to guide planning, decision making, and policy development regarding EMS.

National planners envisioned EMS systems of the future as being community-based and fully integrated within the over-all health system. They believed that EMS personnel should have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. These new practices were to be developed from redistribution of existing health care resources and integrated with other health care providers and public health and public safety agencies. The proposed design was to improve community health and result in a more appropriate use of acute health care resources. EMS would remain the public's emergency medical safety net. The "AGENDA" proposed continued development of 14 attributes of an effective EMS system. For a full text of the original "AGENDA" access the NHTSA web site at www.ems.gov.

Emergency Medical Services at the Crossroads (2006) was the work of The Committee on the Future of Emergency Care in the United States Health System. The Committee was tasked with examining the full scope of emergency care, from 9-1-1 and medical dispatch to hospital-based emergency and trauma care. They discovered that insufficient progress had been made in implementing the AGENDA and envisioned a system in which all communities would be served by well planned and highly coordinated emergency care services that are accountable for their performance. All EMS and public safety offices should be fully interconnected to ensure that each patient receives the most appropriate care, at the optimal location, with the minimum delay.

The NEW VISION for EMS

The Federal Interagency Committee on EMS (FICEMS) supported a major revision of the AGENDA (*work started in 2016*). The **EMS Agenda 2050** is supported by the following:

- National Highway Traffic Safety Administration Office of EMS
- Health Resources and Services Administration EMS for Children Program
- Dept. of Health and Human Services Office of the Assistant Secretary for Preparedness and Response
- Dept. of Homeland Security Office of Health Affairs

These and other federal partners, along with EMS stakeholders have been working to develop a new document to guide the evolution of EMS over the next 30 years. The **Agenda2050 Envision the Future** first draft was released May 1, 2018. The public comment period closed May 31, 2018 with an anticipated release date of the final document in August 2018. They plan a National Implementation Forum in Washington D.C. in September 2018. Information is available at: <http://emsagenda2050.org/>.

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The Draft Agenda calls for EMS Systems to be designed around six guiding principles:

- Inherently safe and effective
- Integrated and seamless
- Sustainable and efficient
- Reliable and prepared
- Socially equitable
- Adaptable and innovative

What 2050 looks like

EMS care and operations across the country focus on practices that yield good outcomes and reduce harm.

“EMS medical care in every community is based on the best available evidence and best practices, with a focus on outcomes determined by the community and the patients, including patient-reported outcome measures. These outcomes, as well as the evidence-based processes involved in achieving them, are measured and publicly reported.” **This includes educational content, processes, and practitioner credentialing.**

“Community and regional **quality improvement systems** measure, analyze and work to improve outcomes for patients, providers and members of the broader community. These systems cut across organizational boundaries and include input from across the care continuum, including, but not limited to, first responders and EMS providers, hospitals and medical specialists, and patients.”

The education of EMS and other healthcare professionals promotes and supports an integrated system of care.

“Interprofessional and interdisciplinary education systems prepare EMS providers and their healthcare colleagues to work collaboratively together. Students learn early on in their education about the roles and responsibilities of other providers on the healthcare team and also spend time with those providers in both the clinical and educational environments.

Education of advanced EMS providers includes a comprehensive orientation to public health, social services, mental health and social determinants of health in a way that truly empowers them to provide integrated care. Curricula also ensure that EMS providers are prepared to collect, share, analyze and use the data available to them.”

EMS and its public safety partners learn together, train together and prepare together in order to respond as a unified team.

“Career opportunities encourage members of the EMS workforce to **pursue further education** while remaining clinical providers, through the creation of EMS subspecialty and leadership education programs, as well as the further integration of EMS with other healthcare professions.

Expanded bridge programs take advantage of and supplement **veterans' military medical training** and experience, ensuring that veterans are adequately prepared to work in non-military EMS environments.”

The education of EMS providers reflects practice in the field and prepares them to take care of patients in any environment.

“The education of all EMS professionals occurs in an academic setting, with a **focus on clinical and operational problem-solving and decision-making**. EMS educational programs are **led by qualified teams of EMS physicians and educators** who themselves have been carefully selected, groomed and educated to prepare future EMS providers to deliver people-centered care. These **teams include experts in the design and delivery of educational programs**.

Clinical education includes realistic simulation and time in patient-care settings, with opportunities to perform hands-on assessments and technical procedures and develop critical communication skills while under the supervision of trained clinical educators.

National standards and certification ensures consistent baseline education and competency of all EMS personnel, assuring communities, employers and the public that every certified EMS provider is qualified and capable.

Continuing education is tailored to the needs of patients, communities and EMS providers, taking advantage of technology and data to deliver education that fills gaps and supplements previous education to ensure continued competency and further growth of providers. Technology facilitates “just-in-time” asynchronous training focused on the current and emerging health needs of the community.

Opportunities exist for EMS providers of all levels to receive **specialty education and certifications**. These specialists provide education in their areas of expertise and are also used when their services are needed in the field. Personnel information systems maintain accurate records of providers' specialty training to ensure the right resources can be utilized at the right time based on the needs of patients and communities."

EMS systems prioritize leadership development and succession planning, supported by EMS higher education programs.

Educational programs prepare all EMS providers to take on leadership roles, helping EMS systems develop leaders who can fill roles ranging from field supervisors to executives.

The delivery of high-quality EMS is a **multi-disciplinary endeavor** that includes well trained and educated paramedics, nurses, advanced practice providers and physicians.

"In order to deliver optimal patient care, EMS **continuing education needs to ensure that our EMS professionals are actually being taught the latest and most up-to-date evidence.**"

EMS education provides a solid foundation of medical, operational and other knowledge, but **focuses on critical thinking and the ability to incorporate new science and tools into one's practice.**

EMS professionals at every level learn how research and evidence can impact the standard of care and do not associate their profession with specific skills or medications that may or may not continue to be a part of their practice as the evidence base evolves.

Innovation techniques, including performance improvement, prototyping and rapid implementation, testing and evaluation, are taught in initial and continuing education.

EMS 3.0 will guide operations In Value-Based Healthcare Systems of the future

Over the last 50 years, EMS Version 2.0 saw a broadening the limits of what EMS could do and substantially refined the expectation of what an EMS system should be. It broadened our scope of patient care and laid a path for the future we should strive to attain (Robbins, 2017).

"Now, we're on the cusp of the next fundamental evolution in EMS. A new model, spearheaded by the National EMS Management Association (NEMSMA), National Association of EMTs (NAEMT), National Association of State EMS Officials (NASEMSO), National Association of EMS Physicians (NAEMSP) and the National Association of EMS Educators (NAEMSE), called EMS 3.0 was unveiled in 2017 after multiple years of work and national summits.

The hallmarks of best practices in a high performance EMS System fall into three domains: Clinical proficiency, Operational effectiveness, and Fiscal efficiency.

New paradigm: Provide the right care, in the right place, at the right time, based on person needs and choice, and at the right cost.

EMS 3.0 describes the changes necessary for EMS to integrate into the broader U.S. healthcare system reforms currently underway. It recognizes that as American healthcare transitions to a value-driven, outcomes and evidence-based model, so must EMS. It focuses on the need for our profession to fall in line with the **Institute for Healthcare Improvement's (IHI) Triple (now quadruple) Aims:**

- Improve the patient experience of care, including quality and satisfaction
- Improve the health of populations
- Reduce the per-capita cost of healthcare (IHI)
- Add now the goal of improving the work life of health care providers, including clinicians and staff.

To do this, we must change the framework for how EMS healthcare is funded, financed, and measured. EMS 3.0 underscores that how we structure our systems and deliver care needs to change in order to be successful, both for our patients and for our agencies' fiscal health. Performance standards will be tied to patient outcomes, including patient satisfaction.

For info on IHI Triple Aims see: <http://www.ihl.org/engage/initiatives/TripleAim/Pages/default.aspx>
For info on EMS 3.0 see: <http://naemt.org/initiatives/ems-transformation>

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So, we must prepare for a future that is rapidly approaching (if not here already) and best projections indicate that it will be consumer-centric, digitally-enabled, and highly integrated. This will require us to be internally nimble. Efficient, effective clinical care and service delivery will be essential, with success rewarded and failure punished through reimbursement methodologies implemented by the Centers for Medicare and Medicare Services (CMS) and adopted by the health insurance industry.

Our future value will depend on old and new factors: Rapid response, quality clinical assessment and care on scene and safe transport to an appropriate healthcare facility will only be part of the picture. We will be expected to contribute to optimizing the health status of individuals and their communities and help them navigate through the healthcare environment which includes a whole host of new alternate response, assessment, care, discharge or disposition options.

EMS is already viewed as a versatile, mobile, community healthcare resource. It will now play an increasingly core role in supporting the well-being of the community through data-driven, population oriented, evidence-based, and safe approaches to prevention, response, and clinical care. EMS organizations must collaborate with their community partners and have access to the resources they need, including up to date technology and a highly educated, healthy workforce (Agenda 2050 Straw Man poll, 2018).

EMS agencies will demonstrate their value by expanding their services to include: community health screenings, injury prevention initiatives, mitigation strategies for chronic repetitive patients, assistance programs to improve patient compliance with healthcare plans, well-being checks, mechanisms to route patients to the appropriate segment of the healthcare system, expanded on-scene care to eliminate the need for transport, and strengthening bonds between patients and primary care practitioners” (Robbins, 2017).

Some of the documents influencing EMS Education and QM planning:

- National EMS Education Agenda for the Future A Systems Approach (2000)
- National Core Content: The Domain of EMS Practice
- The National EMS Scope of Practice Model (will be updated in 2018)
- National Model EMS Clinical Guidelines (March 2018 edition)
- National Guidelines for Educating EMS Instructors
- National EMS Education Standards (January 2009)
- The Committee on Accreditation of Educational Programs for the EMS Professions (CoA) Standards & Guidelines (January 1, 2016) and the Standards Interpretations.
- The Illinois EMS Systems Act (Source: P.A. 81-1518; 88-1.), the corresponding Rules and Regulations, and the Illinois Department of Public Health (IDPH) Division of EMS & Highway Safety EMS Strategic Plan approved September 2010.
- The National EMS Research Agenda; Federal, CDC, and State directives with respect to emergency preparedness planning; the National EMS Information System (NEMIS) data sets and IDPH directives regarding their implementation. See Appendixes for full background information.

National and State standards regarding EMS credentialing

The practice of EMS is complex, dynamic and diverse. It is historically built upon the domains of education and licensure. The public is best served when EMS providers receive externally accredited education, are nationally certified, state licensed, and credentialed by local EMS MDs (NAEMT/NAEMSP position statement, 2016).

While EMS personnel in Illinois are licensed by IDPH, they must be credentialed and awarded practice privileges by the local EMS Medical Director (EMS MD). The diversity of education, performance expectations, clinical and operational protocols, scopes of practice, and equipment used across various EMS Systems requires local verification of a practitioner’s clinical and operational competencies.

An EMS MD has the final authority and accountability for the education, credentialing, and medical direction provided to all EMS practitioners within their System and shall be actively involved in the education and clinical credentialing process.

Credentialing involves at a minimum:

- Demonstration of sufficient cognitive knowledge
- Demonstration of mature, responsible affective ability
- Demonstration of competency performing critical psychomotor skills; and
- Demonstrated ability to integrate the three domains in thinking critically and acting responsibly during the provision of clinical care.

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Strategic planning must reflect a balance of effectiveness, efficiency and equity. Planning and practice is based on community and customer needs, regulatory requirements, national standards, and technological advances while being ever considerate of scarce human and economic resources that must be applied in a manner that optimizes the preparation and competency of EMS personnel and promotes the safety, health and welfare of all persons using best practice models.

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Robbins, V.D. (2017). EMS 3.0 document to guide operations in value-based healthcare systems. Accessed on line: <http://www.jems.com/articles/print/volume-42/issue-1/departments-columns/management-focus/ems-3-0-document-to-guide-operations-in-value-based-healthcare-systems.html>

EDUCATIONAL Systems

Impact statement	Adoption of the National EMS Education Standards, National Scope of Practice Model (2018), the national EMS Education Agenda for the Future (2000) and the Agenda 2050 (2018) updates, the national Continuing Education Agenda for the Future, the National EMS Core Content, and the standards and guidelines published by the Committee on Accreditation of EMS Programs and National Registry of EMTs highly impact education content, how EMS education is delivered and how entry level competency is measured.
Position	<p>Education programs exist to prepare EMS personnel in all three domains of learning to deliver safe, timely, efficient, effective, equitable, compassionate and person-centered care within their scope of practice to serve the health care needs of the population using contemporary evidence-based, best practice models.</p> <p>Educational programs achieve a national standard of excellence by promoting and supporting a professional teaching and learning environment and outcomes measurements as outlined in the EMS Agendas for the Future and other best practice models.</p>
Actions	<ol style="list-style-type: none">1. The III EMS Education committee discusses best practice models and proactively explores trends of the future and works with stakeholders to focus on providing forward-thinking solutions by:<ul style="list-style-type: none">▪ Creating a knowledge hub via collaborative planning so we do the right things at the right level with hardwired roles and responsibilities with built-in accountability for key stakeholders.▪ Inviting input & participation from EMS educators at all levels.▪ Providing EMS education thought leadership.▪ Providing high quality educational resources and mentoring so we effectively navigate through change.▪ Providing structures that encourage alignment with national guidelines and discourage outlier/counterproductive behavior. 2. Educators shall be mentored and held accountable for maintaining a service driven culture as they model excellence and comply with national guidelines.<p>Each EMS program will have a primary instructor with Illinois Lead Instructor certification. Educator competency shall be measured through evaluations that meet NAEMSE, CoAEMSP, and/or CAPCE criteria as applicable. Programs are encouraged to use the Danielson Framework for Teaching as a model for defining instructional domains and evaluating faculty competency.</p> 3. Professional ethical standards and adult learning principles shall govern all educational programs. Achieving educational objectives in all domains of learning (cognitive, psychomotor, and affective) is fundamental to professional growth and clinical excellence.<p>Educational programs shall validate that participants have achieved conceptual, technical, contextual, integrative, innovative, and adaptive competence as outlined in the Agenda 2050 in addition to skills related to teamwork, diplomacy, and professionalism.</p> 4. Curriculum design, lesson plans, teaching methods, assessments and outcomes measurement for EMD, EMR, EMT, AEMT-EMT-I, paramedic, PHRN, ECRN, TNS, and CE classes shall be based on education standards for that professional discipline and reflect best-practice models. This includes, but may not be limited to ensuring that programs

meet or exceed the minimum recommended number and distribution of educational hours, core content, and patient care contacts, skill revolutions/competencies, medical director oversight, and use valid and reliable measurement tools that are mapped to objectives. Once outcome data is collected, programs shall create and post action plans for each domain of learning.

5. All EMS educational programs shall have **IDPH site code** approval in compliance with submission criteria outlined in the EMS Rules. Commission on Accreditation for Prehospital Continuing Education (**CAPCE**) approval also recommended for EMS CE offerings.
6. **By 12-31-2020:** All Paramedic programs shall achieve CoAEMSP accreditation or be under a Letter of Review. By 12-31-22, all paramedic programs shall have CoAEMSP accreditation.
7. **By 1-1-2023:** All new graduates of EMT, AEMT/EMT-I and Paramedic education programs shall pass the **National Registry of EMTs cognitive exam (and psychomotor exams** if required) for licensure eligibility in Illinois. This does not impact those licensed prior to this date nor must NREMT certification be maintained as a criteria for state relicensure.
8. Programs will analyze root causes of performance gaps and explore methods to achieve desired outcomes for practice competency and learning outcomes.
9. Expanded bridge programs take advantage of and supplement **veterans'** military medical training and experience, ensuring that veterans are adequately prepared to work in non-military EMS environments.
10. EMS programs advocate for and advance innovative methods for currently licensed and future EMS practitioners to achieve **Associate or Bachelor's degrees** in EMS or healthcare-related discipline.

Career opportunities encourage members of the EMS workforce to pursue further education while remaining clinical providers, through the creation of **EMS subspecialty and leadership education programs**, as well as the further integration of EMS with other healthcare professions.
11. **Continuing education** is tailored to the needs of patients, communities and EMS providers. EMS CE offerings maintain and expand core competencies. Content presented is based on a local needs assessment to reinforce core concepts tied to the education standards, present new or novel advances based on high quality research or advances in the profession, and/or is tied to quality management outcomes. The number of state-approved contact hours by topic and sources of approved offerings is reviewed bi-annually and published by IDPH.
12. EMS Systems will continue to explore the efficacy of **innovative methods to provide EMS education** and/or continuing education including digitized offerings.

From the Agenda 2050 draft:

1. EMS care and operations across the country focus on practices that yield good outcomes and reduce harm.
2. The education of EMS and other healthcare professionals promotes and supports an integrated system of care.
3. EMS and its public safety partners learn together, train together and prepare together in order to respond as a unified team.
4. The education of EMS providers reflects practice in the field and prepares them to take care of patients in any environment.

For additional background information, see Appendix

CLINICAL CARE

Impact statements	<p>Clinical proficiency, the externally verified provision of quality patient care will have new value determinations that center around compliance with clinical bundles proven through peer-reviewed studies to make a difference in patient outcomes. Clinical bundles for conditions such as STEMI, stroke, sepsis, trauma, hypoglycemia, and asthma have been published and are supported by organizations such as the Eagles Consortium. Additionally, a single source of quality oversight for all EMS, first response, and ambulance components helps ensure all providers share common credentialing and quality improvement processes (Hooten, 2017).</p> <p>"Advances in technology and provider education will enable EMS systems to provide increasingly sophisticated clinical care. The menu of state-of-the art interventions available to patients will be limited primarily by outcomes data and community needs" (Robert E. Suter, D.O., MHA).</p> <p>Health care top investment areas over the next three years:</p> <ul style="list-style-type: none"> • Data analytics • Care redesign efforts • Patient experience improvement • Care coordination <p>As patient populations become increasingly diverse, providing culturally competent care is more important than ever (H&H Networks; The 2018 Environmental Scan).</p>
Position	<p>We are committed to providing safe, timely, competent, compassionate, efficient, effective, equitable, cost-effective, and evidence-based person-centered care to serve the health care needs and wishes of the population. Clinical excellence is the uncompromisable cornerstone for our existence.</p>
Actions	<ol style="list-style-type: none"> 1. A State-wide culture is promoted that rewards individual and organizational contributions, innovation, and commitment to achieving excellence in patient care. 2. Standing medical orders (SOPs) and practice standards shall be evidence-based, justifiable based on community health care needs, and mutually defined by the Region EMS Medical Directors with input from all provider disciplines. 3. EMS care shall continue to be subject to ongoing evaluation to determine its impact on patient outcomes. 4. Systems shall have all new technologies, products, and therapeutic interventions systematically evaluated for their impact on patient outcomes and appropriateness for EMS use (i.e., meets standards of practice; portable, proven cost-benefit analysis; effective, reliability in the field environment, adds needed value and/or information to out-of-hospital care, meets community health needs) prior to their initiation/implementation. 5. EMSC: MSC 02 Performance Measure <p>Pediatric Emergency Care Coordinator (PECC) The percentage of EMS agencies in the state or territory that have a designated individual who coordinates pediatric emergency care.</p> <p>By 2020, 30% of EMS agencies in the state or territory have a designated individual who coordinates pediatric emergency care.</p> <p>By 2023, 60% of EMS agencies in the state or territory have a designated individual who coordinates pediatric emergency care.</p> <p>By 2026, 90 percent of EMS agencies in the state or territory have a designated individual who coordinates pediatric emergency care.</p>

6. EMSC 03 Performance Measure Use of pediatric-specific equipment

The percentage of EMS agencies in the state or territory that have a process that requires EMS providers to physically demonstrate the correct use of pediatric-specific equipment.

By 2020, 30% of EMS agencies will have a process that requires EMS providers to physically demonstrate the correct use of pediatric specific equipment, which is equal to a score of 6 or more on a 0–12 scale.

By 2023, 60% of EMS agencies will have a process that requires EMS providers to physically demonstrate the correct use of pediatric specific equipment, which is equal to a score of 6 or more on a 0–12 scale.

By 2026, 90% of EMS agencies will have a process that requires EMS providers to physically demonstrate the correct use of pediatric specific equipment, which is equal to a score of 6 or more on a 0–12 scale.

“Health Care 2020: Transformative Innovation,” Healthcare Financial Management Association, 2016

“An Investor’s Insight into Telehealth,” The National Law Review, May 3, 2017

“Annual Industry Outlook: The Road to Value-Based Care,” HealthLeaders Media, January/February 2017

CONTINUOUS QUALITY MEASUREMENT AND IMPROVEMENT

Impact statements	<p>"The ability of EMS to optimally meet communities' and individual patient's needs is dependent on evaluation processes that assess and improve the quality of EMS. Continuous evaluation is essential and should pervade all aspects of every EMS system" (Theodore R. Delbridge M.D., MPH).</p> <p>External accountability - Requiring the provider to routinely and publicly report on its performance to an organization or governing body can hold it accountable and helps ensure continual review and enhancement of the system (Hooten, 2017)</p> <p>"We've made great strides in EMS data collection over the last decade. But it's vital we continue that momentum to make sure we're using the information - whether that's to improve the care we deliver, to ensure the safety of our patients and providers, or to guide public health and prevention efforts," (Noah Smith, EMS Specialist with the NHTSA Office of EMS, 2016).</p> <p>Institute for Healthcare Improvement (IHI) 2018 Safety resolutions adapted for EMS:</p> <ul style="list-style-type: none">▪ Learn from what goes right, as well as what goes wrong.▪ Move from reactive and responsive to proactive and generative.▪ Invest in quality systems for learning, rather than just individual projects.▪ Shift from fear, blame and liability toward humility, trust and transparency.▪ Understand that quality is more than just the avoidance of mistakes and physical harm, but also the pursuit of excellence and optimal outcomes.
Position	<p>An EMS System's main reason for existence is to provide quality patient care in the out-of-hospital environment and to meet the expectations of our internal and external customers. In that effort we shall be data, information, and evidence-driven. Our effectiveness shall be gauged by a continuous and comprehensive evaluation of all aspects of the system including structural, process, and outcome measures while being sensitive to issues of confidentiality.</p>
Actions	<ol style="list-style-type: none">1. IDPH and EMS Systems will emphasize the value and importance of information and data and recognize the role of information at all levels of sophistication. Further, we shall highlight widespread application of information within EMS agencies and across all components of healthcare and public safety and clarify the role and purpose of national and statewide data collection efforts (Becknell, 2016).2. An information culture shall be based on the following priorities:<ul style="list-style-type: none">• Industry-wide prioritization of information• Strong motivation, relevancy and demonstrated improvement• Leaders who champion the use of information• A data- and information-savvy workforce• A continuous feedback loop3. EMS Systems shall determine aspects of care to be studied based on identified needs, EMS Compass or other national/state/regional and/or local criteria, and/or new processes or interventions. They shall determine benchmarks or thresholds that should be met; define indicators, generate measurement tools, accurately collect data; analyze the data in comparison to thresholds, determine root causes for process disconnects or outcomes less than targets, suggest tactics to improve performance, and construct reports to be published to system members and stakeholders.

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5. A variety of QI tools are used to conduct quality management strategies: Six sigma, PDCA (plan-do-check-act), DMAIC (define, measure, analyze, improve, control; 5 whys and hows – problem (why?); symptoms (why?); symptom (why?); root cause (why?); corrective actions (why and then hows?); control charts, identify special cause variations; FMEA (Failure modes and effects analysis).
6. Results of data analyses shall be reported showing System performance/ outcomes compared against national or state benchmarks when existent.
7. Recommended action plans shall be presented through CE, to System leaders and to key stakeholders.
8. The efficiency, effectiveness, and quality of System structure, personnel performance, processes, and customer satisfaction shall be periodically measured and reported.
9. The effectiveness of process improvements will be assessed, analyzed, documented, and reported.

Becknell, J., Simon, L. (2016, December). *Beyond EMS data collection: Envisioning an information-driven future for Emergency Medical Services* (Report No. DOT HS 812 361). Washington, DC: National Highway Traffic Safety Administration.

Hooten, D. (2017). Best practices in high value EMS. EMS World; accessed on line: <http://emsworld.com/node/219383>

Appendix EDUCATION PROGRAMS

The 1996 National EMS Agenda recommends the following tactics:

- Ensure excellence of EMS educational programs.
- Update core content objectives frequently enough so they reflect EMS health care needs.
- Incorporate research, quality improvement, and management learning objectives in higher level EMS education.
- Conduct EMS education with medical direction.
- Seek accreditation for EMS education programs.
- Establish innovative and collaborative relationships between EMS education programs and academic institutions.
- Recognize EMS education as an academic achievement.
- Adopt the principles of the National EMS Education and Practice Blueprint.
- Develop a system of reciprocity of EMS credentials.

The National EMS *Education Agenda for the Future* proposes the following outcome points:

- EMS education develops competence in the areas necessary for EMS providers to serve the health care needs of the population. Educational outcomes for EMS providers are congruent with the expectations of the health and public safety services that provide them. EMS education emphasizes the integration of EMS within the overall health care system. In addition to acute emergency care, all EMS educational programs teach illness and injury prevention, risk modification, the treatment of chronic conditions, as well as community and public health.
- EMS education is of high quality and represents the intersection of the EMS professional and the formal educational system. The content of the education is based on nationally developed National EMS Education Standards. There is significant flexibility to adapt to local needs and develop creative instructional programs. Programs are encouraged to excel beyond minimum educational quality standards. EMS education is based on sound educational principles and is broadly recognized as an achievement worthy of formal academic credit.
- Basic level EMS education is available in a variety of traditional and non-traditional settings. Advanced level EMS education is sponsored by institutions of higher education and most are available for college credit. Multiple entry options exist for advanced level education, including bridging from other occupations, basic EMS levels, and for individuals with no previous medical or EMS experience. All levels of EMS education are available through a variety of distance learning and creative, alternative delivery formats.
- Educational quality is assured through a system of accreditation. This system evaluates programs relative to standards and guidelines developed by the national communities of interest. Entry level competence is assured by a combination of curricula standards, national accreditation, and national standard testing.
- Licensure is based upon the completion of an approved/accredited program and successful completion of the national exam. This enables career mobility, advancement, and facilitates reciprocity and recognition for all levels.
- Interdisciplinary and bridging programs provide avenues for EMS providers to enhance their credentials or transition to other health career roles, and for other health care professionals to acquire EMS field provider credentials. They facilitate adaptation of the work force as community health care needs, and the role of EMS, evolves.
- EMS education supports and fosters critical thinking, research and service, and provides opportunities for cooperation and strategic linkages between all essential components for the delivery of quality EMS care.
- The system proposed in the *Educational Agenda* offers a number of benefits, including greater predictability for component development cycles, and a clear and definite method for introducing changes to the system. These provisions clarify the process for accommodating medical advances, technology development, and other needs that affect the scope or content of EMS education while following the attributes of the *EMS Agenda for the Future*.

Paramedic *Continuing Education* National Guidelines

(The U.S. DOT, in cooperation with the U.S. Department of Health and Human Services Public Health Services and the Health Resources & Human Services Administration, Maternal and Child Health Bureau, published the Continuing Education National Guidelines)

- Supported by NHTSA, these guidelines replace the 1985 EMT-P and EMT-I Refresher Courses. They are part of a series of courses making up a national EMS training program consistent with the recommendations of the *National EMS Education and Practice Blueprint*, the *EMT and Paramedic Practice Analysis*, and the *EMS Agenda for the Future*.
- Advocates that CE should move toward a quality assurance model that identifies individual and system areas for improvement and incorporates these topics into the CE program.
- A major emphasis of this document is to transition EMS education and continuing education from strictly an hours-based to a competency-based approach. They give rationale for the necessity of recertification/ relicensure including the rapid expansion and perpetually changing nature of medical knowledge and skills and professional accountability. Trends dictate that providers "prove" their ongoing competence.
- The model suggested in this document addresses two primary areas of concern: (1) competence (measure of minimum proficiency of EMS providers' knowledge and skills) and (2) ongoing education which is designed to assure that the EMS provider obtain "new" knowledge and skills as well as maintain prior knowledge and skills. Underlying their model is the assumption that credentialing agencies expand the number and types of mechanisms through which a provider can demonstrate competence.
- They recommend that the assessment process used in relicensure provide a complete picture of the EMS professional's competence in three areas:
 - Actual field performance (assessment of practice outcomes)
 - Assessment of potential to practice: Ability to respond appropriately to a wide range of patient situations including those that are important, new, or infrequently encountered. Local EMS agencies should offer structured education on topics identified through their QI program as an emerging need.
 - Assessment of professional qualities (attitudes and behaviors)
- Mechanisms for competency assurance are specified. *Competency-based education, directly toward the attainment of specific, behaviorally defined objectives requires separate tests of the attainment of each of the competencies.*
 - Needs assessment
 - Assurance of knowledge through a variety of CE and refresher programs
 - Assurance of skill proficiency through field performance evaluation, hospital clinical performance evaluations, skills workshops, and performance examinations
- The document states that EMS systems should ensure that CE helps providers keep up with the rapid changes in emergency care. Local medical directors must verify that personnel are competent in local/regional equipment, policies, and procedures. For every system change, verification of the training and implementation process must be documented.
- The *"Kirkpatrick Model"* is advocated as an evaluation process for the education program
 - Level I: Learner's reactions in post-class questionnaires. Provides immediate feedback to improve future programs.
 - Level II: Evaluate whether learning has occurred through written and practical exams.
 - Level III: Evaluate job performance and application of the education to real life situations.
 - Level IV: Evaluate if education had a positive impact on patient outcomes.