

A National Strategy to Promote Prehospital Evidence-Based Guideline Development and Implementation

INTRODUCTION

In 2001, the National Emergency Medical Services (EMS) Research Agenda identified a need for a national investment in EMS research infrastructure and the application of scientific evidence to improve patient care.¹ In the 2006 report “Emergency Medicine at the Crossroads,” the Institute of Medicine’s Committee on the Future of Emergency Care in the United States Health System recommended the development of evidence-based protocols for the treatment of emergency medical systems (EMS) patients, and charged the National Highway Traffic Safety Administration with a role in this effort.² Following this report, NHTSA, in partnership with the Health Resources and Services Administration’s (HRSA) EMS for Children (EMSC) Program, provided funding for several efforts to develop and implement evidence-based guidelines for prehospital care.^{3,4}

In 2008, through funding from NHTSA, the Federal Interagency Committee on EMS (FICEMS) and the National EMS Advisory Council (NEMSAC) cosponsored a meeting to identify a process for developing evidence-based guidelines (EBGs) for EMS. This effort culminated in the publication of the National Prehospital Evidence-Based Guideline Model Process, which includes a comprehensive, systems-based approach that incorporates collaboration of EMS and medical professionals from many disciplines.⁵ With funding from NHTSA and EMSC, this model was subsequently used to develop guidelines for pediatric seizures, prehospital pain management, and the use of air ambulances to transport trauma patients from the scene of injury.^{4,6-9} In 2012, a cooperative agreement was awarded by NHTSA, with supplemental funding from the EMSC Program, to the National Association of State EMS Officials (NASEMSO) to examine the development, dissemination, implementation, and evaluation of EBGs at the state level.

The NEMSAC reviewed these and other efforts and, in 2012, published a list of recommendations to further the progress of the use of EBGs in EMS.¹⁰ These recommendations included:

1. Forming relationships with stakeholder organizations and academic journals to hasten the process of publishing EBGs
2. Making efforts to incorporate EBGs into national EMS education
3. Further implementing the strategies presented in the National EMS Research Agenda, including defining prehospital patient outcome measures, promoting training of EMS researchers, and creating funding sources specifically for EMS research, in order to support the development of EBGs

4. Creating Center(s) of Excellence for EMS EBG development
5. Making the process of developing EBGs more efficient by creating supporting mechanisms, such as a registry of current EBG efforts with prehospital relevance worldwide
6. Incorporating into Federal grant guidance language that qualified EBG processes be used for grants
7. Sponsoring a regular EBG Scientific Assembly that brings together practitioners and academic EMS professionals to prioritize future EBG development and determine best practices for developing and implementing EBGs

More recently, FICEMS released a Strategic Plan to ensure coordination among Federal agencies to support improving the delivery of EMS and 911 systems throughout the nation. Presented at its March 2014 meeting, one of six strategic goals stated in the plan is to support data-driven and evidence-based EMS systems that promote improved patient care quality. Within this goal, the first strategic objective is to “support the development, implementation and evaluation of [EBGs] according to the National Prehospital EBG Model Process.”¹¹

The creation of prehospital EBGs provides a unique opportunity to enhance highway safety through improvements in treatment and outcomes for victims of motor vehicle crashes. Recent EBGs on air medical transport of prehospital trauma patients,⁹ prehospital pain management,⁷ and external hemorrhage control,¹² serve as examples of ways that the National Prehospital EBG Model Process can be utilized to standardize and improve the care of these patients. Further enhancements in the care of motor vehicle crash victims and other prehospital patients can be achieved through the creation of a sustainable Strategy to promote development, implementation, and evaluation of prehospital EBGs.

In an effort to support the FICEMS Strategic Plan and acting on the recommendations of the NEMSAC, in August 2013, NHTSA competitively awarded to the National Association of EMS Physicians (NAEMSP) a cooperative agreement to support the development of this National Strategy by engaging EMS stakeholders at all levels to help identify sustainable approaches to promote, develop, and implement EBGs. This document outlines the Draft Strategy that was developed by an expert working group from NAEMSP in collaboration with representatives of organizations and institutions representing all aspects of prehospital care.

MISSION STATEMENT

The mission of this Strategy is to engage EMS stakeholder organizations, institutions, and agencies in a sustainable process that promotes the development and implementation of evidence-based guidelines for prehospital care in the United States.

APPROACH

Overview

In August 2013, NHTSA funded a competitive cooperative agreement with NAEMSP to support the development of a National Prehospital EBG Strategy. NAEMSP identified a project lead and steering committee to facilitate this effort and began by contacting representatives from EMS stakeholder organizations to participate in development of the Strategy. A meeting with broad participation was held to perform a needs assessment and seek input and collaboration for determining the best practices and approach for EBG development and implementation. Attendees and additional stakeholders were engaged through subsequent conference calls to further develop elements of the Strategy. This document was written by members of the steering committee with input from many of the process participants.

Project Steering Committee

A steering committee was convened by NAEMSP that represented physicians, researchers, and field providers from the United States and Canada (Appendix A). Representatives included EMS medical directors, a prior participant in the development of the National Prehospital Evidence-Based Guideline Model Process,⁵ a state EMS medical director, a representative of the NAEMSP Board of Directors, a representative of NHTSA with experience in multiple prior prehospital EBG efforts, and an experienced EMS researcher and paramedic. The steering committee provided input on identifying stakeholders, facilitated discussion among participants during an in-person meeting and several conference calls, and provided input on addressing the Strategy objectives. Throughout the process, steering committee members facilitated the incorporation of stakeholder input into individual Strategy objectives and the development of action items that formed the core of the Strategy.

Strategy Objectives

The process described above led to a set of broad objectives. These objectives aimed to facilitate sustainable mechanisms to develop and implement EMS EBGs.

1. Identify national, state, tribal, and local stakeholder organizations whose missions include improving prehospital clinical care
2. Develop mechanisms to build and sustain relationships among the identified organizations and encourage their participation in the development and implementation of EMS EBGs
3. Expand existing opportunities to conduct scientific research supporting the development, implementation, and evaluation of EBGs and to develop opportunities to present research findings to diverse audiences

4. Identify ways to promote interest in EBG development among researchers, emergency physicians, prehospital care providers, and EMS officials
5. Identify pathways to promote the incorporation of newly developed EBGs into EMS education standards and continued competency training, as well as to stimulate the development of educational and training resources for use by EMS educators and by state and local EMS agencies
6. Promote the dissemination and implementation of EBGs

Stakeholder Engagement and Strategy Development

The initial process for Strategy development included identifying national, state, tribal, and local organizations whose missions include improving prehospital clinical care. Organizations that have previously been involved in the development of national EMS EBGs were identified. An initial list of potential organizations, agencies, and institutions was obtained through review of participants involved in the National Prehospital Evidence-Based Guideline Model Process.⁵ This prior effort identified 41 organizations, including national medical organizations, EMS organizations, research institutions, and federal partners. Snowball sampling¹³ was then used as part of an iterative process of contacting and identifying additional stakeholders to be included in development of the Strategy.

The leadership from each of the identified organizations was contacted to invite a representative to participate in the development of the Strategy, review the existing list of stakeholders, and provide recommendations of additional stakeholders. Organizations were engaged by identifying a specific contact person. All identified stakeholder organizations that agreed to participate in this Strategy are listed in Appendix B and are now being engaged further for comments on this draft Strategy document.

A meeting was held that brought together 48 participants representing 40 EMS stakeholder organizations. Presentations were provided including: a primer on EBG development, recent and ongoing EBG-related efforts, and the identification of various challenges to development and implementation of prehospital EBGs (Appendix C). Stakeholders were engaged in a needs assessment to further national efforts for prehospital EBGs. Breakout group sessions were utilized to develop potential strategies tied to the objectives of the Strategy. A summary of these suggested strategies was discussed further by the entire stakeholder group to gain consensus on specific strategies. Finally, the meeting served to identify additional stakeholders, who were subsequently engaged in the Strategy development.

Over the ensuing months, several calls were held to obtain additional input from stakeholders and to refine the strategies. All input received from stakeholders was summarized, collated, and reviewed by the steering committee, then used to develop the recommended strategies outlined below.

STRATEGIES

Refer to Appendix D for Action Item details

Action Item #1: Create a Prehospital Guidelines Consortium

A needs assessment for this Strategy identified several key elements that are needed to improve the quality and efficiency of prehospital EBG development and implementation efforts:

- Improved communication among EBG project groups, from project development through completion
- Facilitated contact with relevant stakeholders
- Improved cohesiveness and efficiency of EBG efforts, including avoidance of effort duplication
- Mechanisms for vetting of EBGs by researchers, stakeholders and end-users
- Promotion of funding mechanisms for EBG projects
- Fulfilment of other actions in this Strategy in a sustainable fashion through widespread involvement of stakeholders

We propose the creation of a Consortium of representatives from national EMS and medical organizations with the mission of providing enhanced communication, collaboration, and synergism of efforts among organizations involved in EMS to promote the development and implementation of prehospital EBGs. Proposed operating guidelines for the Consortium are provided in Appendix E. Representatives from key organizations that are most closely and actively involved in prehospital EBG efforts would form an Executive Committee of voting members (marked as “Responsible” in the RACI Matrix) and would be responsible for leading work groups of the Consortium, as well as supporting funding of a modest proposed budget (Appendix F). Activities of the Consortium would include:

- Facilitating improved communication related to EBG development projects, research, and education efforts among member organizations and other stakeholders
- Developing and maintaining a document detailing ongoing gaps in EBG knowledge to inform directions in EBG-related research and EBG development projects
- Disseminating newly-created prehospital EBGs through its member organizations
- Maintaining a repository of existing prehospital EBGs and facilitating access by end-users
- Carrying out other items of this Strategy (outlined below)

The Consortium would not be tasked with the development or implementation of individual EBGs, which should remain the activity of individual project groups through separate funding mechanisms. These project groups may be optimally led by national medical or EMS organizations with interests directly related to the guideline topic.

Action Item #2: Promote Research Related to Prehospital Evidence-Based Guidelines

The development of prehospital EBGs is dependent on the availability of scientific evidence on which to base recommendations. Unfortunately, limited research exists that can guide medical practice in the prehospital setting. Research is needed to identify current knowledge gaps in EMS medicine and expand the knowledge base available to create EBGs, including the performance of prehospital randomized controlled trials and systematic reviews. Therefore, a necessary aspect of promoting the creation of new prehospital EBGs must be to facilitate the creation of new scientific evidence, to disseminate that knowledge, and to facilitate comprehensive evaluations of scientific evidence as part of the guideline development process.

Prior efforts have identified areas of EMS that need further research, and include the National EMS Research Agenda¹ and the Gap Analysis of EMS-Related Research,¹⁴ among others.¹⁵⁻¹⁸ Additionally, the Proceedings of the Implementation Symposium of the National EMS Research Agenda¹⁹ provided specific methods to move the recommendations forward. These included improving training opportunities for EMS researchers, increasing funding sources for EMS research, facilitating the integration of research into practice, and crafting alterations within the regulatory environment. We support these prior recommendations and recommend the development of an updated agenda for EMS-related research that specifically addresses knowledge gaps that impact the development of prehospital EBGs. Consensus conferences such as those developed by the Society for Academic Emergency Medicine could be utilized as part of an iterative process identifying where research gaps exist on a particular topic or for the development of prehospital EBGs in general.

In addition to promoting clinical research that can be utilized to develop new evidence-based guidelines, there is a need for research that evaluates the effectiveness of existing EBGs. This research should include an assessment of the impact of specific guidelines on patient-centered outcomes and the operational or cost-reduction benefits of guidelines. Furthermore, translational medicine research should be performed that identifies evidence-based processes for implementing EBGs into practice, focusing on implementation science (the interface between science and the clinical environment where it can be applied), knowledge translation (achieving awareness and agreement on use of evidence-based guidelines by prehospital and related providers), behavioral change theory (evaluation of the science on behavior and change management as it relates to EMS and other health care providers' implementation of prehospital guidelines), and use of best practices (as determined through consensus of an expert panel, such as implementation "toolkits" and other standardized implementation techniques).

A Prehospital Guidelines Consortium would facilitate the creation of a work group to create a prehospital EBG-related research gap document, utilizing the EMS Research Agenda for the Future as a foundation and other NHTSA-supported research efforts that have identified

and prioritized research needs (e.g., EMS Outcomes Project^{16,17} and EMS Cost Analysis Project²⁰). As part of scheduled revisions of the EBG-related research gap analysis, the Consortium could determine if its prior recommendations have resulted in completion of research in the desired topic areas. Through its meetings, the Consortium and its member representatives would be able to provide letters of support for EBG-related research projects that are best poised to advance the development and implementation of prehospital EBGs.

Action Item 3: Promote Development of Prehospital Evidence-Based Guidelines

The creation of the National Prehospital EBG Model Process⁵ provided a structured process that has been successfully utilized to create EMS EBGs for seizure management, pain management, air medical transport, and hemorrhage control.^{6,8,9,12,21} The development process requires several distinct steps, including: 1) assembling the expert panel and providing Grading of Recommendations, Assessment, Development and Evaluation (GRADE)^{22,23} or similar methodology training; 2) defining the EBG content area and questions to address; 3) performing systematic literature searches; 4) applying the literature review to each question; 5) vetting and endorsing draft recommendations; and 6) synthesizing recommendations into a usable EMS protocol or algorithm.⁸ This is a resource-intensive process that has typically been performed independently for each guideline. We propose mechanisms to streamline and facilitate this process, including identifying best practices for guideline development as recommended by stakeholders and other experts. We further recommend utilizing elements of one guideline development effort to expedite the creation of other EBGs, such as shared use of current literature reviews on similar topics or sharing of sample educational content among guideline development projects.

An initial step to promote guideline development is to identify areas of EMS that would most benefit from EBGs. As a starting point for this document, the NASEMSO Model Clinical Guidelines document²⁴ and similar efforts could be analyzed to distinguish evidence-based guidelines (based on robust analysis of available research) from consensus-based recommendations (based on the guidance of an expert panel) to identify topics for future EBGs. Rigorous tools such as the GRADE grid²⁵ and the guidelines checklist of Schunemann, et al.,²⁶ should be utilized in planning for new EBGs and for determining when it is appropriate to proceed with guideline development on a particular topic. Similarly, the National EMS Information System (NEMSIS)²⁷ and the Practice Analysis being performed by the National Registry of Emergency Medical Technicians could be utilized as sources of information on the most common conditions and procedures encountered in the prehospital setting, as well as information on variations in practice that can help identify what aspects could be best impacted by new EBGs. Identifying topics for EBGs should also take into account how much research is available on the topic, what EBG is most likely to be utilized and benefit the greatest number of

providers, what EBG projects are likely to get funded, and additional specific input from stakeholders of all provider levels.

EBGs should be developed using processes consistent with the Institute of Medicine recommendations from Clinical Practice Guidelines We Can Trust,²⁸ the National Prehospital EBG Model Process,^{3,5} and the GRADE^{22,23,25} (or similarly-rigorous) methodology. Other recommendations include the funding and establishment of Evidence-Based Practice Centers (EPCs) or similar institutions to perform systematic reviews as part of guideline development, avoiding the time-consuming process of teaching a content expert panel about scientific literature review for each individual EBG effort. As an example, Bulger, et al., used a systematic review of the literature that was funded by NHTSA and performed by the ECRI Institute, one of eleven EPCs designated by the U.S. Agency for Healthcare Research, to facilitate the creation of an EBG on external hemorrhage control.¹² Similarly, other components of model EBG projects can be utilized by new EBG project groups to streamline the process of creating EBGs and incorporate lessons learned from prior efforts.

The Prehospital Guidelines Consortium could create and maintain a guidance document that identifies stakeholder contacts and content experts for specific EBG topics, experts who can teach GRADE and other necessary methodological concepts, and outside organizations that can assist with primary literature reviews or other components of guideline development. This document could identify for project groups a standardized process for guideline review and support by the Consortium's representative members and recommend a standardized process and timeline for guideline revisions. The Consortium could also identify methods to include patient/consumer input during the guideline development process, such as by locating patients/consumers who are willing to serve on guideline development panels and connecting guideline development groups with these panels.

Action Item #4: Promote Education Related to Prehospital Evidence-Based Guidelines

In addition to the limited quantity and quality of research in prehospital care,²⁹ there has been a limited emphasis on education of EMS providers in evidence-based medicine principles. Due to a lack of routine training in the importance of prehospital research, EMS providers may be reluctant to participate in research projects and are less likely to inquire about the evidence-base supporting their protocols. However, there exists support for a paradigm shift on the performance of prehospital research and use of EBGs for prehospital care.^{3,10} An essential step is the improvement of education of EMS providers on evidence-based medicine, including the incorporation of EBGs into national EMS education standards and curricula.¹⁰ Furthermore, there should be concurrent education of EMS educators, physicians, and affiliated staff who interact with EMS providers and are in a position to impact the implementation and use of EBGs during prehospital care.

Students in EMS education may latch on to information without understanding that healthcare is constantly evolving and that changing evidence may alter the information they are taught in the future. To foster the use of EBGs, the basic principles of research and EBG methodology should be incorporated into initial education of EMS providers at all levels. EBG principles and content should be specifically incorporated into the National EMS Core Content,³⁰ National EMS Education Standards,³¹ and textbook and online EMS educational content. Organizations such as the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professionals (CoAEMSP), Continuing Education Coordinating Board for EMS (CECBEMS), National Registry of Emergency Medical Technicians (NREMT), National Association of EMS Educators (NAEMSE), NASEMSO and NAEMSP could lead the effort of teaching and encouraging EMS educators to incorporate this content into their curricula. EBG concepts could be incorporated into continuing education for EMS providers of all levels by organizations including the American Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP), CoAEMSP, CECBEMS, Emergency Medical Services for Children (EMSC), International Association of Fire Chiefs (IAFC), International Association of Fire Fighters (IAFF), NAEMSE, NAEMSP, National Association of EMTs (NAEMT), NREMT, and National Volunteer Fire Council (NVFC). EBG concepts could then be incorporated into national and state-based EMS provider initial certification and recertification examinations by the NREMT and state EMS offices. Medical organizations could disseminate information to EMS affiliated providers (physicians, nurses, physician assistants, etc.) on the use of evidence-based medicine in EMS and encouraging the use of existing prehospital EBGs as allowed by local regulations and protocols.

Upon publication of new EBGs, educational content developed by the project team could be reviewed by the Prehospital Guidelines Consortium and distributed to state EMS offices through NASEMSO. The Consortium could develop a resource document on model educational methods, resources, and sample content that can be utilized to educate providers about new EBGs, including the use of a diverse set of educational mechanisms such as standard presentations, online interactive content, podcasts, online videos, and social media.

Educational resources could be created that support individuals who will create EBGs. This may include the creation of an educational material development resource center, educational material development workshops, and graduate programs for EMS and related healthcare providers.

Action Item #5: Promote the Implementation of Prehospital Evidence-Based Guidelines

In the United States, various models exist for how protocols are developed and implemented, with implementation occurring at the local, county, regional, or state level. This results in wide variability of protocols and notable challenges to implementation of new evidence-based protocols in EMS systems.^{7,32,33} The challenge of implementing new guidelines

is not limited to the EMS setting and occurs in other healthcare settings. A key component of new guideline acceptance is review, input, and vetting by stakeholders who will be in a position to implement the guideline and whose effort will be needed to support its use.³⁴ Additionally, there is a lack of information on what tools are successful for implementation of guidelines in EMS systems at the state, local, or regional level.

A structured process for review and vetting of guidelines by EMS stakeholder organizations that would be in a position to support, disseminate, and aid in the implementation of guidelines among its members throughout various EMS systems should be developed. Creation of a Prehospital Guidelines Consortium would provide an opportunity for these stakeholders to be engaged at all stages of guideline development and implementation. Review of guidelines for implementation would be informed by the use of structured evaluation tools that identify challenges to and feasibility of implementation, such as the Appraisal of Guidelines, Research and Evaluation (AGREE) and the Guideline Implementability Appraisal (GLIA) tool.^{35,36}

Perceptions of bias or conflict of interest have the potential to negatively impact the implementation of guidelines. Review of guidelines by the Consortium and all relevant stakeholders would be well informed if guideline development projects include clear reporting of any conflict of interest by those participating in their development and implementation. These conflicts of interest should be clearly stated in the publication of guidelines and implementation recommendations.

A structured mechanism for guideline dissemination to ensure the widest distribution and potential for implementation should be created. Upon publication, guidelines could be distributed to each member organization of the Consortium. NASEMSO could be the lead organization to disseminate published evidence-based guidelines through state EMS offices for incorporation in state-based protocols or further distribution at the regional and local level. NAEMSP could disseminate guidelines through its membership, including EMS medical directors who are in a position to implement those recommendations in local and state-based protocols. CoAEMSP and NAEMSE could ensure that guidelines are distributed to training centers for incorporation in EMS educational curricula. The proposed Prehospital Guidelines Consortium could maintain an easily accessible online repository of prehospital guidelines and facilitate guidelines being forwarded for publication to the National Guidelines Clearinghouse (www.guideline.gov).

Each guideline development project should include tools that aid in implementation, such as the creation of “shovel-ready protocols” and educational content related to the guideline, ensuring guidelines are available in a format that is easy to understand by end-users. Multiple strategies that are flexible and can be incorporated across various EMS systems should be considered. A training packet that is published or made available with the guideline’s publication could be used directly by local groups as part of their implementation. Educational

materials including an executive summary should be created for EMS medical directors and may incorporate education on the background of the guideline's development, thus facilitating training of the educators that will be asked to implement these guidelines.

Additional research is needed on best practices for implementation. Such practices may include the creation of toolkits for implementation and the incorporation of statements about the evidence-base of guideline components to facilitate implementation of the most impactful elements. National organizations such as NAEMSP and NASEMSO could be engaged in knowledge-sharing that identifies when individual groups encounter challenges or barriers to implementation, as well as how those challenges were overcome, thus informing implementers in other EMS systems. A common publication date should be established to assist EMS systems in planning revisions of their protocols on a uniform schedule that facilitates incorporation of new and revised EBGs. Upon publication of individual guidelines, a timeline should be established by the project group that identifies when the guideline would be reasonably expected to be implemented in EMS systems (on average anticipated to take 1-2 years from publication) and when the guideline should be reviewed and revised (on average recommended to occur every 5 years). Specific timelines for implementation and revision should be based on the available evidence, knowledge of additional research expected in the subject area, and the strength of existing recommendations.

Action Item #6: Promote Standardized Evaluation Methods for Prehospital Evidence-Based Guidelines

Evaluation of effectiveness and outcomes is an essential part of EBG development and implementation, and a component of the National Prehospital Evidence-Based Guideline Model Process.⁵ Monitoring of pertinent quality improvement indicators and comparison to benchmarks can help inform the effectiveness of implementation techniques and the clinical impact of guidelines that are implemented. Use of uniform data definitions and repositories, including the National Emergency Medical Services Information System (NEMSIS) should be central to any system evaluation.^{27,37,38}

All guideline development projects should incorporate a set of standard outcome and quality measures as part of an evaluation component. These can be utilized by end-users and administrators in assessing the impact of guidelines that are implemented. Funders of EBG projects should consider incorporating these outcome and quality measures as part of an evaluation component for funding guideline projects. Impact analysis findings should be disseminated to funding agencies and guideline developers so that funding and further research can refine future guideline development efforts.

Action Item #7: Promote Funding for the Development and Implementation of Prehospital Evidence-Based Guidelines

Continued funding for evidence-based guideline development is essential and will dictate the speed by which we are able to advance to having a comprehensive set of prehospital evidence-based guidelines. In its 2012 Summary Recommendations, NEMSAC recommended that FICEMS work with NHTSA, the National Institutes of Health (NIH), the National Quality Forum (NQF), and the Agency for Healthcare Research and Quality (AHRQ) to create funding sources specifically for EMS research in order to support the development of EBGs.¹⁰ Furthermore, NEMSAC recommended that FICEMS work with NHTSA, AHRQ, and other member agencies to create Center(s) of Excellence for EMS EBG development. Our stakeholder representatives have widely supported these recommendations as the optimal mechanism to advance the development of prehospital EBG, yet the creation of Center(s) of Excellence for EMS EBG development requires a level of funding that has not yet been realized. In the short term, we recommend continued support from Federal partners and other EMS and medical organizations to fund new projects to develop and implement new prehospital evidence-based guidelines.

Essential to maximizing the effectiveness of funded EBG development efforts is ensuring that projects are efficient in the use of resources and have the greatest reach in implementation. The proposed Prehospital Guidelines Consortium would support more efficient guideline development through improved communication and structured mechanisms for stakeholders to review and support new guidelines. This includes supporting standards for guideline development that are supported by stakeholders, including the EBG Model Process,⁵ The Consortium would facilitate the development and distribution of tools for education and implementation of guidelines, potentially maximizing the adoption of those guidelines. These uniform processes and improved collaboration among stakeholders have the potential to result in long-term cost-savings not realized by the perpetual recreation of all components of guideline development and implementation by individual project teams.

SUMMARY

Recent recommendations from the NEMSAC and from the FICEMS Strategic Plan support the creation of a sustainable national Strategy for the development, implementation, and evaluation of prehospital evidence-based guidelines. This Strategy must be built on a strong foundation of stakeholder involvement with close collaboration and synergism of efforts among organizations and institutions that are actively involved in all aspects of prehospital care. Creation of a Prehospital Guidelines Consortium would improve communication among stakeholders and EBG project groups, improve efficiency of EBG development, and support

more widespread adoption of prehospital EBGs. Other elements of this Strategy promote EMS research that supports EBG development and education of EMS providers in evidence-based medicine, one of several components that may lead to improved implementation of EBGs.

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Appendix A
The Steering Committee for the National Prehospital Evidence-Based Guidelines Strategy

Role	Name	Affiliation
<u>Steering Committee</u>		
Principal Investigator	Christian Martin-Gill, MD, MPH	University of Pittsburgh
Writing Team Members	Blair Bigham, MSc, ACPf	St. Michael's Hospital
	Joshua B. Gaither, MD	University of Arizona
	Douglas F. Kupas, MD	Geisinger Health System
	J. Brent Myers, MD, MPH	Wake County Department of Emergency Medical Services
	Daniel W. Spaite, MD	University of Arizona
Contracting Office Technical Representative	Catherine S. Gotschall, ScD	National Highway Traffic Safety Administration
Administrative Staff	Stephanie Newman	National Association of EMS Physicians

Appendix B
**EMS Stakeholder Organizations Engaged in Development of the National Prehospital
Evidence-Based Guidelines Strategy**

Lead Organization

National Association of EMS Physicians (NAEMSP)

Strategy Sponsors

Department of Transportation, National Highway Traffic Safety Administration, Office of
Emergency Medical Services (NHTSA/OEMS)

Department of Health and Human Services, Health Resources and Services Administration, EMS
for Children Program (HRSA/EMSC)

National Medical Organizations

Air Medical Physicians Association (AMPA)

American Academy of Emergency Medicine (AAEM)

American Academy of Pediatrics (AAP)

American College of Emergency Physicians (ACEP)

American College of Osteopathic Emergency Physicians (ACOEP)

American College of Surgeons Committee on Trauma (ACS-COT)

American Heart Association (AHA)

American Stroke Association (ASA)

Emergency Nurses Association (ENA)

Medical Device Manufacturers Association (MDMA)

Society for Academic Emergency Medicine (SAEM)

Society of Emergency Medicine Physician Assistants (SEMPA)

Society of Trauma Nurses (STN)

Emergency Medical Services Organizations

American Ambulance Association (AAA)

American Medical Response (AMR)

American Red Cross (ARC)

Commission on Accreditation of Ambulance Services (CAAS)

Commission on Accreditation of Medical Transport Services (CAMTS)

Committee on Accreditation of Educational Programs for the Emergency Medical Services
Professionals (CoAEMSP)

Congressional Fire Services Institute (CFSI)

Continuing Education Coordinating Board for EMS (CECBEMS)

EMS World

International Academies of Emergency Dispatch (IAED)
International Association of EMS Chiefs (IAEMSC)
International Association of Fire Chiefs (IAFC)
International Association of Fire Fighters (IAFF)
International Association of Flight and Critical Care Paramedics (IAFCCP)
International Trauma Life Support (ITLS)
Journal of Emergency Medical Services (JEMS)
National Association of EMS Educators (NAEMSE)
National Association of EMTs (NAEMT)
National Association of State EMS Officials (NASEMSO)
National Collegiate Emergency Medical Services Foundation (NCEMSF)
National EMS Advisory Council (NEMSAC)
National EMS Management Association (NEMSMA)
National Registry of EMTs (NREMT)
National Volunteer Fire Council (NVFC)
Prehospital Emergency Care (PEC)

Research Institutions

Baylor College of Medicine
Children's National Health System
Dalhousie University
EMSC National Resource Center
Grading of Recommendations Assessment, Development, and Evaluation (GRADE) Working Group
International Liaison Committee on Resuscitation (ILCOR)
Johns Hopkins University
Resuscitation Outcomes Consortium (ROC)
University of Maryland, National Center for the Study of Trauma and EMS
University of North Carolina
University of Pittsburgh

Federal Partners

Department of Health and Human Services, Agency for Healthcare Research and Quality
Center for Outcomes and Evidence (AHRQ/COE)
Department of Health and Human Services, Health Resources and Services Administration,
Office of Rural Health Policy (HRSA/ORHP)

Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response (ASPR)

Department of Homeland Security, Office of Health Affairs (OHA)

Indian Health Service, Division of Clinical and Community Services (IHS/DCCS)

National Institute of Health, Office of Emergency Care Research (NIH/OECR)

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Appendix C
Stakeholder Meeting Presentations and Small-Group Sessions

Session	Presenter/Lead Discussant
EBG Strategy Project Overview	Christian Martin-Gill, MD
Critical Concepts in EBG Development	Eddy Lang, MD
Recent Prehospital EBG Efforts	
Characteristics of Statewide Protocols for Emergency Medical Services in the United States	Douglas F. Kupas, MD
The Development of Evidence-based Prehospital Guidelines Using a GRADE-based Methodology	Kathleen Brown, MD
Statewide Implementation of a Prehospital Care Guideline Project	Matthew Sholl, MD & Peter Taillac, MD
Integrating Evidence-Based Pediatric Prehospital Protocols Into Practice	Manish Shah, MD
Pediatric Evidence-Based Guidelines: Assessment of EMS Systems Utilization in States (PEGASUS)	Manish Shah, MD
An Evidence-based Guideline for External Hemorrhage Control in the Prehospital Setting	Eileen Bulger, MD
Evaluation of the Statewide Implementation of the EMS TBI Guidelines in Arizona	Daniel Spaite, MD
Evaluation of OHCA/AHA EBGs for CPR Quality and for Dispatcher-Assisted CPR in Arizona	Bentley Bobrow, MD
National Association of State EMS Officials Model EMS Clinical Guidelines	Carol Cunningham, MD
Challenges to Development and Implementation of Prehospital EBGs	Daniel W. Spaite, MD
Development of an EBG Strategy	Christian Martin-Gill, MD
Next Steps for EBG Development and Implementation (Small Group Sessions)	
Promotion of Research Supporting EBG Development and Implementation	Blair Bigham, MSc, ACPf
Promotion of EBG Development Among Emergency Physicians, Prehospital Care Providers, and EMS Officials	Douglas F. Kupas, MD
Incorporation of Newly Developed EBGs into EMS Education Standards and Continued Competency Training	Joshua B. Gaither, MD
Best Practices for EBG Implementation in States with Statewide Protocols	Douglas F. Kupas, MD
Best practices for EBG Implementation in States with Regional or Locally-Developed Protocols	J. Brent Myers, MD
Use of Evidence-Based Guidelines by Individual Providers	Blair Bigham, MSc, ACPf
Summary of Next Steps for EBG Development and Implementation	EBG Steering Committee

Appendix D – EBG Strategy Action Items and RACI Matrix

Action Item 1: Create a Prehospital Guidelines Consortium (PGC)

Objective: To create a Consortium of representatives from stakeholder organizations to facilitate and promote prehospital EBG development, implementation, and evaluation.

Organizations Supported by this Action Item: EMS and medical organizations that are currently, or are in a position to be, involved in activities related to EBG development, implementation, and evaluation. The Consortium would also facilitate liaison relationships with research institutions and Federal agencies involved in prehospital EBG-related projects.

Resources Required:

- Funding to support the operations of the Consortium, provided by the core organizations forming the Consortium’s Executive Committee (refer to proposed annual budget in Appendix F)
- Financial support for individuals to participate in the Consortium, including its workgroups (at a minimum, organizations should support travel and other costs for their representatives to participate in the Consortium’s annual meeting and relevant workgroup activities)
- At the first meeting of the Consortium, the Executive Committee must determine the member organization(s) that will manage the budget and provide administrative support

Barriers to Completion:

- Securing a reliable, consistent source of funding for the operation of the Consortium (members of the Consortium Executive Committee capable of providing this support should be identified very early and agree to a minimum shared level of support)
- Administrative support for operations of the Consortium (NAEMSP has offered to coordinate the initial formation and meeting of the Consortium; following the initial meeting of the Consortium and designation of Executive Committee members through consultation with stakeholders, a lead organization could be selected by the Consortium to provide continued administrative support and coordination of the budget)

Performance Measures and Timetable for Completion:

Performance Measures:

1. Formation of the Prehospital Guidelines Consortium
2. Meetings of the Prehospital Guidelines Consortium

Timetable for Completion:

- Formation within 1 year of publication of the Strategy
- One annual meeting and at least three quarterly conference calls

Responsibility Assignment:

R = Responsible														A = Accountable										C = Consulted										I = Informed													
NATIONAL MEDICAL ORGANIZATIONS														EMERGENCY MEDICAL SERVICES ORGANIZATIONS																				RESEARCH INSTITUTIONS	FEDERAL PARTNERS												
PGC	AMPA	AAEM	AAP	ACEP	ACOEP	ACS-COT	AHA	ASA	ENA	NAEMSP	MDMA	SAEM	SEMPA	STN	AAA	AMR	ARC	CAAS	CAMTS	CoEMSP	CFSI	CECBEMS	EMS World	IAED	IAEMSC	IAFC	IAFF	IAFCCP	ITLS	JEMS	NAEMT	NAEMSE	NAEMSO	NCEMSF	NEMISAC	NEMISMA	NREMT	NVFC	PEC	AHRO/COE	HRSA/EMSC	HRSA/ORHP	ASPR	OHA	NHTSA	HIS/DCCS	NIH/OECC
-	R	R	R	R	R	R	C	C	I	A	I	R	I	I	C	I	C	C	C	C	I	C	I	C	C	C	C	C	I	I	R	C	R	C	C	C	C	I	I	C	C	C	C	C	C	C	

Action Item 2: Promote Research Related to Prehospital Evidence-Based Guidelines

Objectives: To promote research related to prehospital EBGs through an open, consensus process, including:

1. Promoting research that can be utilized to create or update prehospital guidelines, that evaluates the effectiveness of guidelines, or that identifies evidence-based processes for implementing EBGs into practice
2. Creating and maintaining a research gap document related to prehospital EBGs
3. Providing support for EBG-related research projects

Organizations Supported by this Action Item: Research institutions, medical organizations and EMS organizations that participate in the performance or evaluation of research related to prehospital EBGs, and Federal agencies that fund and otherwise support prehospital research.

Resources Required:

- Workgroup within the PGC to work on research components of this Strategy with participation of scientists and leaders in the field of EMS research and EBG development
- Maintenance of a database of research related to EMS EBGs

Barriers to Completion:

- Potential limited acceptance of research recommendations of the Consortium by those who will actually conduct the research (being addressed by the inclusive and iterative nature of the current process)
- Sufficient research funding is essential to attract researchers and fill the gaps that exist, allowing the creation of additional prehospital EBGs

Performance Measures and Timetable for Completion:

Performance Measures:

1. Creation of a research-related workgroup and meeting schedule
2. Creation of a prehospital EBG-related research gap document
3. Review and support of EBG-related research projects

Timetable for Completion:

- Performed during first meeting of the PGC
- Created and revised by the PGC on a regular, scheduled basis
- Performed by the PGC on a regular, scheduled basis

Responsibility Assignment:

R = Responsible														A = Accountable										C = Consulted										I = Informed														
NATIONAL MEDICAL ORGANIZATIONS														EMERGENCY MEDICAL SERVICES ORGANIZATIONS																				FEDERAL PARTNERS														
PGC	AMPA	AAEM	AAP	ACEP	ACOEP	ACS-COT	AHA	ASA	ENA	NAEMSP	MDMA	SAEM	SEMPA	STN	AAA	AMR	ARC	CAAS	CAMTS	CoAEMSP	CFSI	CECREMS	EMS World	IAED	IAEMSC	IAFC	IAFF	IAFCCP	ITLS	JEMS	NAEMSE	NAEMT	NAEMSO	NCEMSF	NEM/SAC	NEM/SMA	NREMT	NVFC	PEC	RESEARCH INSTITUTIONS	AHRQ/COE	HRSA/EMSC	HRSA/ORHP	ASPR	OHA	NHTSA	HIS/DCCS	NIH/OECR
A	R	R	R	R	R	R	R	R	I	R	I	R	I	I	I	I	C	I	I	I	I	I	C	C	C	C	C	C	I	I	C	C	R	C	C	C	C	C	C	R	R	C	C	C	R	C	R	

Action Item 4: Promote Education Related to Prehospital Evidence-Based Guidelines

Objectives: To incorporate EBG concepts into education for EMS providers, educators, managers, regulators, physicians, and EMS-affiliated staff by:

1. Incorporating the basic principles of evidence-based medicine (EBM), as well as individual prehospital EBG content, into initial and continuing EMS provider education and certification examinations for EMS providers of all levels
2. Streamline the process for distribution of educational content upon publication of the individual EBGs to EMS and affiliated providers
3. Promote the creation of educational resources for individuals and organizations that will create guidelines

Organizations Supported by this Action Item: EMS organizations and medical organization affiliated with EMS, especially those that are most directly involved in the education of EMS providers, including but not limited to CoAEMSP, CECBEMS, NAEMT, NREMT, NAEMSE, and NAEMSP.

Resources Required:

- Education-related workgroup within the PGC with involvement of representatives from CoAEMSP, CECBEMS, NREMT, and NAEMSE
- Online and print communication tools to disseminate educational content related to EBGs in an efficient manner

Barriers to Completion:

- Local EMS agencies and agency medical directors may be hesitant to adopt evidence-based medicine principles and EBG content into their current protocols, which may be thought to better apply to their local jurisdiction
- Incorporation of EBGs into provider training material, testing, and field protocols will require broad acceptance of EBGs by all levels of providers (this may be supported by the existence of a Consortium with representatives from EMS professional and subspecialty organizations)

Performance Measures and Timetable for Completion:

Performance Measures:

1. Incorporation of EBM principles into new publications of national curricula, core content, educational standards, and standardized examinations in EMS
2. Creation of a guidance document providing awareness of prehospital EBGs, encouraging their use, and providing model educational methods, resources, and sample content to educate providers about new EBGs.
3. Creation of a process for dissemination of educational content on newly published EBGs to medical/EMS organizations and EMS agencies

Timetable for Completion:

- Performed by responsible organizations below within 3 years of publication of the Strategy
- Performed by the PGC within 3 years of publication of the Strategy
- Performed by the PGC, NAEMSP, NASEMSO, and state EMS offices within 3 years of publication of the Strategy

Responsibility Assignment:

R = Responsible														A = Accountable														C = Consulted														I = Informed													
NATIONAL MEDICAL ORGANIZATIONS														EMERGENCY MEDICAL SERVICES ORGANIZATIONS														RESEARCH INSTITUTIONS	FEDERAL PARTNERS																										
PGC	AMP/PA	AAEM	AAP	ACEP	ACOE	ACS-COT	AHA	ASA	ENA	NAEMSP	M/DMA	SAEM	SEM/PA	STN	AAA	AMR	ARC	CAAS	CAN/T/S	CoAEMSP	CFSI	CECBEMS	EMS World	IAED	IAEMSC	IAFC	IAFF		IAFCCP	IT/S	JEMS	NAEMSE	NAEMT	NASEMSO	NCEMSF	NEMSAC	NEMSMA	NREMT	NVFC	PEC	AHRO/COE	HRSA/EMSC	HRSA/ORHP	ASPR	OHA	NHTSA	HIS/DCCS	NIH/OECR							
A	C	C	C	C	C	C	C	C	I	R	I	C	I	I	I	I	C	C	C	R	I	R	I	C	C	C	C	C	I	R	C	R	C	C	C	R	C	I	C	I	C	I	I	C	I	I	I	I							

Action Item 5: Promote the Implementation of Prehospital Evidence-Based Guidelines

Objectives: To promote the implementation of prehospital EBGs by:

1. Providing a mechanism for review and vetting of guidelines through a Prehospital Guidelines Consortium and its member stakeholder organizations
2. Promoting the incorporation of tools that facilitate implementation as part of each guideline development project
3. Supporting the development of implementation science to identify best practices for implementation
4. Developing mechanisms for widespread and structured distribution of guidelines upon publication
5. Developing a recommended timeline for implementation and revision in guideline development projects

Organizations Supported by this Action Item: EMS and medical organizations that are currently involved in or are in a position to be involved in activities related to EBG development and implementation; Federal agencies that are in a position to fund or implement EBG efforts.

Resources Required:

- Implementation-related workgroup within the PGC with involvement of representatives from NASEMSO, NAEMSP, CoAEMSP and NAEMSE
- Updated contact information and methods of distributing EBGs to state EMS offices (could incorporate NASEMSO in this process)

Barriers to Completion:

- Obtaining support from stakeholders for individual guidelines may be a continual barrier to implementation (strong communication with and participation of stakeholders throughout the development and implementation process may facilitate widespread acceptance and adoption)
- Perceptions of bias or conflict of interest could adversely impact implementation (this should be explicitly addressed in all EBG publications)

Performance Measures and Timetable for Completion:

Performance Measures:

1. Creation of a resource document that identifies a structured process for review and vetting of EBGs by the Consortium and its members
2. Creation of a structured process to distribute new EBGs to state EMS offices, EMS medical directors, and EMS training centers.
3. Creation of a resource document that identifies best practices for prehospital evidence-based guideline implementation.

Timetable for Completion:

- Performed by the PGC and maintained on a scheduled, regular basis
- Performed by NASEMSO, NAEMSP, CoAEMSP and NAEMSE and relevant medical organizations within 3 years of publication of this Strategy
- Performed by the PGC in collaboration with NASEMSO and NAEMSP within 5 years of publication of this Strategy

Responsibility Assignment:

R = Responsible										A = Accountable										C = Consulted										I = Informed																	
NATIONAL MEDICAL ORGANIZATIONS										EMERGENCY MEDICAL SERVICES ORGANIZATIONS										RESEARCH INSTITUTIONS										FEDERAL PARTNERS																	
PGC	AMPA	AAEM	AAP	ACEP	ACOE	ACS-COT	AHA	ASA	ENA	NAEMSP	MDMA	SAEM	SEMPA	STN	AAA	AMR	ARC	CAAS	CAMTS	COAEMSP	CFSI	CEGBEMS	EMS World	IAED	IAEMSC	IATC	IAFF	IAFCCP	ITLS	JEMS	NAEMSE	NAEMT	NASEMSO	NCEMSF	NEMSAC	NEMSMA	NREMT	NVFC	PEC	AHRO/COE	HRSA/EMSC	HRSA/ORHP	ASPR	OHA	NHTSA	HIS/DCCS	NIH/DECR
A	R	R	R	R	R	R	R	R	I	R	I	R	I	I	C	I	C	R	R	R	I	C	I	R	R	R	R	R	R	I	R	R	R	C	R	R	R	C	C	C	R	C	C	C	R	C	

Action Item 7: Promote Funding for the Development and Implementation of Prehospital Evidence-Based Guidelines

Objectives: To promote additional funding for the development and implementation of EBGs by:

1. Identifying funding sources that can support future development and implementation of EBGs
2. Identifying resources that can be accessed by EBG development groups to assist with evidence collection and review
3. Providing a mechanism for individuals and organizations seeking funding for EBG development projects to receive support from EMS stakeholders who will be in a position to implement those guidelines

Organizations Supported by this Action Item: This Action item will support EMS organizations, medical organizations, and research institutions that develop or implement EBGs. Federal agencies that are in a position to fund, implement, or evaluate EBG efforts are also supported.

Resources Required:

- Funding-related workgroup within the PGC that can identify funding agencies and facilitate contact with medical and EMS organizations, research institutions, and other groups that are interested in developing EBGs
- In the long term, creation of Center(s) of Excellence for EMS EBG development as previously recommended by the NEMSAC

Barriers to Completion:

- Limited availability of funding for continued efforts to develop and implement prehospital evidence-based guidelines
- Availability of funding for Center(s) of Excellence for EMS EBG development

Performance Measures and Timetable for Completion:

Performance Measures:

1. Provision of additional financial support in the form of grants for efforts related to the development and implementation of prehospital EBGs
2. Creation of a workgroup to identify funding sources, as well as facilitate contacts between funders and organizations, research institutions, and other groups that are interested in developing EBGs

Timetable for Completion:

- Performed by Federal agencies such as NHTSA and HRSA/EMSC on a continual basis
- Performed by the PGC within 3 years of publication of the Strategy

Responsibility Assignment:

R = Responsible														A = Accountable										C = Consulted										I = Informed															
NATIONAL MEDICAL ORGANIZATIONS														EMERGENCY MEDICAL SERVICES ORGANIZATIONS																				FEDERAL PARTNERS															
PGC	AMPA	AAEM	AAP	ACEP	ACOEP	ACS-COT	AHA	ASA	ENA	NAEMSP	MDMA	SAEM	SEMPA	STN	AAA	AMR	ARC	CAAS	CAMTS	COAEMSP	CFSI	CECBEMS	EMS World	IAED	IAEMSC	IAFC	IAFF	IAFCCP	ITLS	JEMS	NAEMSE	NAEMT	NAEMSO	NCEMSF	NEMSAC	NEMSMA	NREMT	NVFC	PEC	RESEARCH INSTITUTIONS	AHRQ/COE	HRSA/EMSC	HRSA/ORHP	ASPR	OHA	NHTSA	HIS/DCCS	NIH/OECR	
A	C	C	C	C	C	C	C	C	I	R	I	C	I	I	C	I	C	C	C	C	C	I	I	C	C	C	C	C	I	I	I	C	R	C	C	C	C	C	C	C	C	R	R	C	C	C	R	C	R

Appendix E

Proposed Prehospital Guidelines Consortium (PGC) Operating Guidelines

Purpose

- The PGC is a representative organization of EMS stakeholders who are involved in promoting the development and implementation of prehospital evidence-based guidelines (EBGs)
- The PGC provides enhanced communication, collaboration, and synergism of efforts among organizations involved in EMS-related evidence-based guideline efforts
- It is the responsibility of each Consortium member to ensure that their organization is briefed and has the opportunity to be involved in relevant evidence-based guideline efforts

Membership and Meetings

- Organizations that are actively involved in the development and implementation of prehospital evidence-based guidelines will be invited to select a voting member of the PGC and an alternate (voting members will form the Executive Committee and will be expected to attend PGC meetings and conference calls)
- Non-voting members of the PGC will include representatives of other EMS stakeholder organizations, as determined by the Executive Committee (all members are encouraged to participate in meetings and conference calls of the PGC)
- Research institutions, Federal agencies, and other relevant organizations may designate a non-voting liaison to interact with the PGC (liaisons will be invited to attend meetings and conference calls of the PGC)
- The PGC will hold at least one annual in-person meeting and three quarterly conference calls

Leadership and Management

- The PGC receives its direction from its voting members (Executive Committee) that form the core of the Consortium
- The Executive Committee will elect a chair who will serve for a 2-year term
- Administrative support for the PGC will be provided through the voting member organizations

Committees and Work Groups

- The Executive Committee may establish standing and ad-hoc sub-committees or workgroups with:

- A chair who is a PGC member
- Co-chairs and other members who do not need to be PGC members and are appointed by the chair of the committee
- Recommended initial workgroups include:
 - Research
 - Development
 - Education
 - Implementation and Evaluation
 - Funding

Reporting and Approval Process

- Committee and work group project plans and draft documents will be presented to the Executive Committee at its meeting(s) or conference calls for comment and approval
- The Executive Committee will review and have the ability to endorse on behalf of the Consortium any project plans or guidelines submitted to the Consortium for review
- On an annual basis, committees and work groups will provide a report to members of the Consortium of its activities over the course of the preceding year
- Members will be responsible for reporting the activities of the PGC to its member organizations. Members will seek endorsement and/or approval of guidelines or other project plans as needed from member organizations
- All members of the Consortium will sign an annual disclosure form, which will be reported publically

Funding

- All member organizations of the PGC will fund travel and other costs related to attending meetings of the PGC for its members
- Voting member organizations that are represented in the Executive Committee will fund meeting and administrative costs of the Consortium as determined by an annual budget
- The annual budget will be developed and approved by the Executive Committee

Appendix F

Proposed Initial Operating Budget for the Prehospital Guidelines Consortium

Item	Unit Cost	Units	Total	Notes
Annual Meeting				
Meeting Room	\$ 0.00	1.00	\$ 0.00	Incorporated in annual meeting of host stakeholder organization (no additional cost)
Meals/Breaks	\$ 86.00	60.00	\$5,160.00	
Audio/Visual	\$1,000.00	1.00	\$ 1,000.00	
Conference Calls	\$30.00	20.00	\$ 600.00	Includes general Consortium and individual workgroup conference calls
Supplies				
Photocopies	\$50.00	1.00	\$50.00	
Postage/Shipping	\$75.00	1.00	\$75.00	
Website	\$ 0.00	1.00	\$ 0.00	Incorporated in host stakeholder organization website (no additional cost)
Other Supplies	\$100.00	1.00	\$100.00	
Administrative Support				
Misc. Administrative Support	\$90.00	48.00	\$4,320.00	
Accounting	\$90.00	12.00	\$1,080.00	
Meeting Planning	\$90.00	5.00	\$450.00	
Total Expenses			\$ 12,835.00	

Appendix G
Disclosures of Potential Conflicts of Interest

Writing Group	Employment	Research Grant	Other Research Support	Speakers' Bureau/ Honoraria	Ownership Interest	Consultant / Advisory Board	Other
Blair Bigham, MSc, ACPf	Ornge Transport Medicine	None	None	None	None	MedicAlert Foundation of Canada	None
Joshua B. Gaither, MD	University of Arizona	NIH/NINDS: (Traumatic Brain Injury); Philips Corporation & Zoll Medical (Real-Time Audio-Visual Feedback in CPR)	None	None	None	None	None
Douglas F. Kupas, MD	Geisinger Health System; Pennsylvania Department of Health	None	None	None	None	None	None
Christian Martin-Gill, MD, MPH	University of Pittsburgh; University of Pittsburgh Medical Center	None	None	None	None	None	None
J. Brent Myers, MD, MPH	University of North Carolina; Wake County Department of EMS	None	None	None	None	None	None
Daniel W. Spaite, MD	University of Arizona	NIH/NINDS: EPIC Study, Implementing the EMS EBGs statewide in Arizona	Medtronic Foundation, Implementing OHCA EBGs statewide in Arizona	None			