

A National Agenda for Community Paramedicine Research

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**North Central
EMS Institute**



prepared by

**Davis G. Patterson, PhD
Susan M. Skillman, MS**

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STEERING COMMITTEE

Principal Investigator:

DOUGLAS KUPAS, MD, is Associate Chief Academic Officer at Geisinger Health System in Danville, Pennsylvania.

Committee Members:

JIM DETIENNE is President of the National Association of State EMS Officials and Co-Chair of the Joint Committee on Rural Emergency Care.

ANNE ROBINSON, RN, BSN, is a Public Health and Community Paramedic Nursing Consultant in Eagle, Colorado.

GARY WINGROVE is President of the North Central EMS Institute.

MATTHEW WOMBLE, MHA, EMT-P, is a Principal at Womble Consulting, a member of the National Organization of State Offices of Rural Health, and past Co-Chair of the Joint Committee on Rural Emergency Care.

ABOUT THE AUTHORS

DAVIS G. PATTERSON, PhD, is a Research Scientist at the WWAMI Rural Health Research Center, Department of Family Medicine, University of Washington School of Medicine.

SUSAN M. SKILLMAN, MS, is the Deputy Director of the WWAMI Rural Health Research Center, Department of Family Medicine, University of Washington School of Medicine.

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Community paramedicine (CP) is an emerging healthcare delivery model that increases access to basic services through the use of specially trained emergency medical service (EMS) providers in an expanded role. CP providers care for patients at home or in other non-urgent settings outside of a hospital under the supervision of a physician or advanced practice provider. CP can expand the reach of primary care and public health services by using EMS personnel to perform patient assessments and procedures that are already in their skill set. Over the past decade, local healthcare gaps around the U.S. and internationally have been filled through CP programs that use EMS personnel to treat non-acute illness in community settings.

In 2010, the Joint Committee on Rural Emergency Care (JCREC), comprised of members from the National Association of State Emergency Medical Services Officials and the National Organization of State Offices of Rural Health, issued a discussion paper that identified both opportunities and challenges for CP in the areas of training, practice, regulation, medical oversight, reimbursement, integration, and evaluation.¹ Though CP program successes have been reported,² objective, systematic research on the outcomes of these programs is lacking.

The North Central EMS Institute, in collaboration with the JCREC, convened a National Consensus Conference on Community Paramedicine on October 1 and 2, 2012, in Atlanta, Georgia. The meeting was sponsored by the Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services. A complete summary of the meeting is available in a separate report.³

At the meeting, investigators from the WWAMI Rural Health Research Center⁴ facilitated a session to inform the development of a national agenda for research on community paramedicine (CP). This report presents the findings from that session, including research-related content and comments offered throughout the two-day meeting.

The facilitators began the research agenda session with a brief presentation to orient attendees to the similarities and differences between quality improvement, program evaluation, and research. The goal was to focus discussion on ways to foster rigorous evaluation and research on community paramedicine. After the presentation, 60 meeting participants⁵ interviewed each other in pairs using a structured round robin format (called the Interview Design Process⁶) so that each person had the opportunity to respond to three questions about research on community paramedicine. Interview partners recorded each other's responses on paper, which WWAMI investigators later compiled. This technique allowed for rapid collection of a large amount of information with all meeting attendees contributing their perspectives. A group discussion followed to elicit any additional comments arising from the paired interview process, concluding the session.

Here we summarize the collective comments of the community paramedicine stakeholders at the meeting, including research-related topics mentioned in the five prior panel sessions. The summary is organized by the three Interview Design Process discussion topics: (1) research priorities, (2) research challenges, and (3) research resources and opportunities. The findings reported here represent a first step to stimulate continued discussion and collaboration aimed at building a national evidence base on community paramedicine.

1. RESEARCH PRIORITIES

Meeting attendees identified an extensive list of research priorities in response to the following questions. This list also incorporates topics mentioned over the course of the two-day meeting. Further work with stakeholders will be needed to refine and prioritize this list.

For community paramedicine services to gain widespread acceptance and qualify for reimbursement, evidence of impact is needed.

What are the **top priority research questions** about community paramedicine that will demonstrate its impact on healthcare processes and outcomes in terms of...

- ...effectiveness (does it produce the desired effect)?
- ...value (does it reduce costs with comparable or better outcomes)?
- ...safety (does it reduce patients' risks)?
- ...access (does it connect patients to needed care)?

Program Development

- Survey current CP programs on basic program descriptors (geographic and organizational settings), objectives, interventions/services provided, resource and equipment needs, workforce, finance, promising practices, and program leader opinions on how CP should develop nationally.
- Inventory state regulations to identify factors that facilitate or discourage development of CP.
- Create a central repository of detailed data CP program data for development and implementation evaluation and research.
- Create a national and international clearinghouse for sharing information about CP program policies and practices, materials, best practices, and research and evaluation findings.
- Conduct research to develop CP program definitions and create a typology of program models.
- Determine CP program models that are most appropriate for various geographies (rural, urban, suburban, regional), organizations (fire-departments, hospitals, stand-alone or “third service” EMS agencies), and types of staffing (volunteer, career/paid).
- Identify sustainable funding models for different reimbursement and regulatory environments.
- Identify best practices for effective stakeholder engagement.

Technology

- Identify appropriate existing and emerging technologies for communications, mobile telemedicine and remote diagnostics, and health information management and data sharing.
- Identify information sharing needs between CP programs and other healthcare entities, and ways to promote collaboration.

Workforce: Education and Competencies

- Create an information clearinghouse on CP educational programs, curricula, certifications, and credentials to inform decisions about education and expanded roles.
- Identify needed knowledge and competencies for CP providers in various settings and with varying levels of pre-existing EMS credentials (e.g., EMT or paramedic). Is there a core set of content in

primary care and public health that all CP providers need? What content should be optional and customized to local needs?

- Investigate the effectiveness and potential reach of different educational modalities for CP providers, such as distance learning and patient simulation.

Workforce: Supply

- Identify the characteristics of EMS personnel that may facilitate recruitment into CP, such as interest in primary care or public health, appropriate career stage, background in EMS or other healthcare experience, and other factors that may make CP a desirable career path.
- As the CP workforce expands, track educational and professional trajectories into CP and identify potential recruitment opportunities, such as military veterans.
- Study the effect of CP on provider job satisfaction, retention, and career aspirations, and compare with that of similarly situated personnel in EMS organizations without CP programs.
- Identify and track CP provider safety hazards and reductions, both direct and indirect. For example, do fewer 9-1-1 responses improve safety for EMS personnel and the public through reduced EMS driving accidents?
- Model the impacts of recruiting EMS providers into CP on overall EMS personnel supply.

Workforce: Demand and Utilization

- Analyze CP provider utilization in EMS organizations to understand relative percentage effort devoted to CP versus traditional EMS response roles. Examine variation in utilization by type of service provided across different types of agencies (e.g., volunteer or career staffing models) and practice settings (e.g., rural/suburban/urban?).
- Study the impact of introducing a CP program on overall community EMS demand, and identify CP services that reduce demand.

Medical Oversight

- Identify appropriate models for providing medical direction with varied CP settings and services provided, and link to patient safety and quality outcomes.

Team Approaches and Integration with Other Providers

- Conduct organizational research on how best to integrate CP providers with other healthcare and public health providers and effective team care approaches in support of Primary Care Medical Homes, Accountable Care Organizations, and other systems of care.
- Document both positive and negative impacts of CP on other care providers, including their perceptions of CP provider roles and satisfaction with CP providers.
- Investigate acceptance of CP providers and whether or not hospitals and other providers make appropriate referrals to CP programs.

System Impacts and Value

- Design studies to compare current (baseline) patient care and disease management practices performed by other providers, costs, and patient outcomes with changes that result from implementation of CP. Examine impacts in rural and urban settings.

- Identify target patient populations, conditions, and care settings where the use of CP providers can yield the greatest cost savings. Potential cost savings to investigate include reduction of:
 - Urgent care and emergency department visits and hospitalizations.
 - Length of hospital stays.
 - Total hospital readmissions or early readmissions for conditions such as congestive heart failure or pneumonia.
 - Clinic visits.
 - 9-1-1 calls for preventable conditions and acute episodic care.
 - Avoidable or inappropriate referrals.
 - Unnecessary treatments.
- Identify services that CP providers can provide to add value in public health systems including:
 - Improving immunization rates.
 - Conducting health promotion.
 - Provide health screenings.
- Document unintended consequences (positive or negative) to EMS systems, other health system organizations, patients, and communities.

Patient Access and Satisfaction

- Identify patient populations and conditions for which CP providers can improve access to timely, appropriate care, such as the uninsured, underinsured, and high risk populations.
- Identify CP services that result in improvements in access (e.g., via reduced wait times to receive care) to primary care, chronic disease management, pain management, referrals to other providers, and receipt of other healthcare and supportive services.
- Study patient expectations, perceptions, and satisfaction with CP services compared with other care from other providers and in other settings.

Patient Safety and Health Outcomes

- Conduct comparative studies of patient safety and risk (e.g., medical errors, adverse events) and health outcomes for patients. Compare usual sources of care, including traditional EMS response, with CP provider care, including (1) treatment at home (treat without transport), (2) transport to the hospital, and (3) transport to alternative destinations. Can CP providers properly triage patients to distinguish those who need a higher level of care? Are patients at home safer by avoiding the risks of hospitalizations, such as hospital acquired infections?
- Identify patient populations and conditions for which CP can improve safety and those for which CP can cause greater harm compared with usual care.
- Identify short- and long-term patient outcomes that are appropriate for measuring the success of a variety of CP interventions, including:
 - Home assessments (e.g., safety).
 - Patient resource need assessments (e.g., food).
 - Chronic disease management (diabetes, CHF).
 - Assisting patients to manage their own healthcare.
 - Acute care response to reduce hospitalizations.
 - Supportive care for assisted living populations.
 - Support for family caregivers.
 - Post-discharge follow-up to prevent readmissions.

- Medication reconciliation and compliance.
- Behavioral health follow-up to increase attendance at appointments.
- Assessment with triage and referral.
- Vaccinations.

Data and Methods for Research and Evaluation

- Determine appropriate definitions, measures, and instruments—using existing ones wherever possible—for studying CP impacts on patient access, safety, health outcomes, satisfaction, and overall healthcare costs.
- Evaluate CP programs in terms of structure, process, and outcomes to understand program development, functioning, and impacts.
- Carefully define appropriate comparison services (e.g., no intervention, other care delivery models) and patient populations for cost/benefit analyses.
- Refine methods to identify the causal connections from specific CP interventions to intermediate and distal patient outcomes, and to assess resource utilization and costs.
- Develop a classification system for CP service lines such as chronic care, home health, emergency care, mental health, and prevention. Compare the relative value, in terms of outcomes and costs, of these service lines with that of current services provided. Use risk adjustment based on patient characteristics for relative cost comparisons.

2. RESEARCH CHALLENGES

Meeting attendees identified barriers to research in response to the following questions. This list also incorporates topics mentioned over the course of the two-day meeting.

Research requires funding sources, topics of interest to funders, research expertise, collaborators, study sites, data, and appropriate methods.

What are the **top barriers to conducting research** on Community Paramedicine? To enable research to happen, what specific resource needs must be addressed?

Identifying Research Priorities

- Challenges in formulating feasible research questions that will provide the information needed to advance clinical knowledge and shape policy.
- No single lead EMS or CP organization to set priorities and marshal resources.

Research Funding, Infrastructure, and Human Resources

- Lack of research funding CP in the context of scant funding for EMS research generally.
- Lack of EMS research infrastructure, including academic research centers, analytical resources, and study sites, upon which to build CP research.
- Lack of research expertise among EMS practitioners and insufficient training opportunities.
- Lack of health researcher expertise in EMS and CP.

- Lack of CP program staff time for conducting research.
- Differences in priorities between funders and researchers.

Stakeholder Support and Involvement

- Lack of awareness, understanding, respect among patients, healthcare providers, and public health providers regarding the EMS profession and the potential benefits of CP.
- Lack of EMS and CP research support from essential collaborators including insurance companies, healthcare system partners, and community stakeholders.
- Lack of EMS agency participation as research study sites; competition and lack of trust between EMS agencies; lack of communication between researchers and EMS practitioners.
- Resistance or competition from other health professions and interest groups that may feel threatened by the development of CP, such as nursing, home health, and unions.
- Lack of quality reporting systems to engage the public in holding EMS accountable for outcomes (e.g., an “EMS Compare” system like CMS’ Hospital Compare).

Data

- Lack of accessible information documenting the basic characteristics of existing CP programs.
- Lack of data and data coordination on patients, interventions, costs, and outcomes to track patients across systems of care and compare CP care with usual care.
- Lack of systems to capture essential data (e.g., EMS data collection is focused on patient transport).
- Inconsistent reporting and missing data in existing systems such as NEMESIS.
- Lack of access to existing data that is proprietary or protected by the Health Insurance Portability and Accountability Act (HIPAA).
- Lack of central data repositories or comparable data elements for CP pilot studies.
- Inability to distinguish services performed by CP providers from those performed by supervising physicians in healthcare claims data.

Methods

- Diverse CP programs and settings that have not been well described for the purposes of identifying research study goals, populations, and program dimensions that may influence outcomes.
- Difficulty demonstrating causal connections between CP interventions and outcomes.
- Identification of appropriate and validated measures to show impact on quality of care and cost.
- Lack of standard definitions of CP program models, data elements.
- Sampling challenges: small numbers of programs and patient sample sizes (especially for specific conditions and rural areas), identifying appropriate comparison groups, selection biases and generalizability.

Government and Regulatory Issues

- Government regulatory and quality assurance requirements that discourage piloting new CP programs and, by extension, CP research.

- Demonstrating to legislators the need for CP programs and research funding.
- HIPAA restrictions on sharing patient data.
- Difficulty of obtaining institutional review board (IRB) approval for experimental or quasi-experimental research in a non-traditional medical setting.

3. RESEARCH RESOURCES AND OPPORTUNITIES

Meeting attendees identified examples of research resources and opportunities in response to the following questions. This list also incorporates topics mentioned over the course of the two-day meeting.

What **resources and opportunities** are available now that could be used to advance Community Paramedicine research? Where can we find funding sources, research expertise, collaborators, study sites, data (in addition to NEMSIS), methods, or other important resources?

Academic Resources

- Academic researchers (universities, academic medical centers) can seek CP research grants, conduct or guide pilot studies, and conduct systematic reviews across all CP programs. Promising candidates include institutions with EMS or rural health research expertise, or a rural healthcare mission. A partial list of academic institutions and centers mentioned by attendees in this area includes:
 - University of Minnesota School of Public Health.
 - University of North Texas.
 - University of New Mexico.
 - University of Tennessee.
 - Louisiana State University.
 - EMS Performance Improvement Center (University of North Carolina, Chapel Hill).
 - EMS Agency Research Network (University of Pittsburgh).
 - Center for Research on Emergency Medical Services (University of Pittsburgh and Center for Emergency Medical Services of Western Pennsylvania, Inc.).
 - Rural Health Research Centers (e.g., WWAMI RHRC), which are federally funded by the Office of Rural Health Policy.
- Academic EMS journals.

Government Institutions

- Potential state and local government partners with interest in CP and research expertise (e.g., epidemiologists) include:
 - Departments of health and public health.
 - State EMS offices, including state EMS for Children programs, injury prevention programs, and trauma registries.
 - State offices of rural health.
 - 9-1-1 systems.
- The federal government can sponsor and encourage formative evaluation, creation of a data clearinghouse, and other CP evaluative activities. Federal funding can provide support for meetings to further develop data and methods to build the CP evidence base. Federal partners include the U.S.

Departments of Health and Human Services (HHS), Homeland Security (DHS), and Transportation (DOT). A partial list of interested federal agencies and initiatives includes:

- Agency for Healthcare Research and Quality (HHS/ARHQ):
 - Patient-Centered Outcomes Research Institute (PCORI).
 - Comparative Effectiveness Research (CER).
 - “Research Activities” online newsletter.
- Health Resources and Services Administration (HHS/HRSA):
 - Office of Rural Health Policy (ORHP).
- Centers for Disease Control and Prevention (HHS/CDC).
- Centers for Medicare and Medicaid Services (HHS/CMS):
 - Innovation Grants.
 - Healthcare claims data.
- Assistant Secretary for Preparedness and Response (HHS/ASPR).
- National Institutes of Health (HHS/NIH).
- National Highway Traffic Safety Administration (DOT/NHTSA).
- Office of Health Affairs (DHS/OHA).

EMS Organizations

- Center for Leadership, Innovation and Research in EMS (CLIR).
- Emergency Medical Services for Children (EMSC) National Resource Center:
 - National EMSC Data Analysis Resource Center (NEDARC).
- International Roundtable on Community Paramedicine (IRCP).
- Joint Committee on Rural Emergency Care (JCREC).
- National Association of EMS Officials (NASEMSO).
- National Association of EMS Physicians (NAEMSP) (EMS Fellowship Curriculum).
- National EMS Management Association (NEMSMA).
- National Registry of EMTs (NREMT).
- North Central EMS Institute (NCEMSI).
- EMS agencies.
- Existing CP programs, both U.S. and international, for study sites, data, models, and, benchmarks. Consortia of EMS agencies can partner to sponsor research. A partial list of examples includes:
 - Ada County Paramedics, Idaho.
 - MedStar Mobile Healthcare, Fort Worth, Texas.
 - North Memorial Healthcare, Minnesota.
 - Regional Emergency Medical Services Authority (REMSA), Reno, Nevada.
 - Western Eagle County Ambulance District (WECAD), Colorado.

Other Healthcare Organizations

- Health systems, including hospitals (e.g., Critical Access Hospitals, teaching hospitals), Accountable Care Organizations (e.g., CMS’ Pioneer ACO Model), Level I trauma centers, and system-affiliated EMS agencies (Allina Health EMS).
- Home health, telehealth, behavioral health, long term care, and hospice providers.

- National Quality Forum (NQF).
- National Organization of State Offices of Rural Health (NOSORH) and National Rural Health Association (NRHA).
- Health Workforce Information Center (<http://www.hwic.org/>).
- American Hospital Association and state hospital associations.
- Health professional associations (e.g., American Nurses Association).
- Healthcare payors.
- Private industry partners:
 - Pharmaceutical companies.
 - Durable goods suppliers.
 - Health information technology (HIT) vendors.
 - Software vendors to build CP data collection systems.
 - FISDAP®.
 - Medicare and Medicaid contractors.

Other Interested Organizations

- Rural Assistance Center (<http://www.raconline.org/>).
- International Association of Fire Chiefs (IAFC).
- EMS unions.
- Non-profit organizations and foundations (e.g., the Robert Wood Johnson Foundation, Bill and Melinda Gates Foundation), including those not historically involved with EMS that have related interests.
- AARP.

Data and Methods Resources

- Potential data sources:
 - Health departments.
 - Electronic Patient Care Reporting (ePCR) and Computer Aided Dispatch (CAD) data.
 - Electronic Medical Records/Electronic Health Records (EMRs/EHRs).
 - Emergency departments.
 - Patient data repositories, such as through quality health networks, state health information exchanges (HIEs).
 - Discharge mapping data.
 - State and local health statistics databases and linked patient registries.
 - Council on Library and Information Resources.
 - CMS healthcare claims data.
 - National EMS Information System (NEMSIS), with addition of CP-related measures.
- Develop research collaborations among multiple CP programs and partners to increase quantity and quality of available data, including creating a national CP data repository.
- Use existing measures of effective, safe, coordinated, and patient-centered care, and measures of access, timeliness, and efficiency from sources such as the Physician Quality Reporting System or AHRQ's Prevention Quality Indicators.

- Use independent evaluators to conduct objective internal clinical reviews and audits and compare with non-CP systems/communities.
- Explore the feasibility of innovative methods, such as tracking lawsuits to measure patient satisfaction as compared with traditional patient surveys.

Resources Within Community Paramedicine

- Community Paramedic website (<http://www.communityparamedic.org/>).
- International Roundtable on Community Paramedicine (<http://www.ircp.info/>).
- Community Paramedicine Evaluation Tool.⁷
- Future stakeholder meetings to collaborate and build consensus.

NOTES

1. Joint Committee on Rural Emergency Care, National Association of State Emergency Medical Services Officials, National Organization of State Offices of Rural Health. State perspectives discussion paper on development of community paramedic programs. <http://www.ruralcenter.org/tasc/resources/state-perspectives-discussion-paper-development-community-paramedic-programs>. Accessed February 8, 2012.
2. National Conference of State Legislatures. Beyond 911: state and community strategies for expanding the primary care role of first responders. <http://www.ncsl.org/issues-research/health/expanding-the-primary-care-role-of-first-responder.aspx>. Accessed December 8, 2012.
3. Patterson DG, Skillman SM. *National Consensus Conference on Community Paramedicine: Summary of an Expert Meeting*. Seattle, WA: WWAMI Rural Health Research Center, University of Washington; Feb 2013.
4. At the University of Washington School of Medicine; “WWAMI” is an acronym for Washington, Wyoming, Alaska, Montana, and Idaho.
5. Three persons viewing the meeting via Webcast also contributed their responses.
6. Cohen C, Patterson D. Carolyn Cohen and Davis Patterson on Interview Design Process. <http://aea365.org/blog/?p=6495>. Accessed February 8, 2013.
7. Health Resources and Services Administration, U.S. Department of Health and Human Services. Community paramedicine: an evaluation tool. <http://www.hrsa.gov/ruralhealth/pdf/paramedicevaltool.pdf>. Accessed February 20, 2013.