Submitted by The Nebraska Emergency Medical Services Association, Children’s Hospital & Medical Center, Nebraska State Volunteer Firefighters Association, Nebraska Flight Association, Medics At Home, the Board of Emergency Medical Services, and the Office of Emergency Health Systems
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In the ever changing and complex environment of our health care system, it is apparent that EMS providers are playing a larger role in caring for Nebraskans. We must ensure that our patients are cared for by providers that are proven to be proficient in treating the patient’s degree of illness severity, especially those that are critically ill or injured. One of the ways we can accomplish this is to ensure a minimal level of competency through education, certification, licensing, and credentialing. In order for this occur, we must first recognize a critical care level of paramedicine in Nebraska. With this, we will empower the NE DHHS and the EMS board, in collaboration with our stakeholders, to develop rules and regulations commensurate with the skills set required to perform these advanced medical activities. Failure to do so would invite potential harm to our Nebraska residents by possibly depriving our patients of the level of care they require during transport, especially those that require more specialized critical care. This applicant group, which encompasses a diverse field of subject matter experts, respectfully submits this credentialing review application for your consideration.
Description of the Applicant Group

1. Provide the following information for the Applicant group(s):

   a. Name, address, telephone number, e-mail address, and website of the applicant group in Nebraska, and any national parent organization;

   Applicants: Nebraska Office of Emergency Health Systems
               Contact: Tim Wilson, Program Manager
               Telephone: 402.471.0124
               Email: Tim.Wilson@nebraska.gov
               Website: DHHS.ne.gov/ems

               Nebraska Board of Emergency Medical Services
               Contact: Michael Miller, EMS Board Member
               Telephone: 402.280.1280
               Email: MikeMiller@creighton.edu

               Nebraska Emergency Medical Services Association
               Contact: Debbie Von Seggern, Immediate Past President
               Telephone: 402.719.0105
               Email: president@nemsa.org
               Website: www.nemsa.org

               Nebraska State Volunteer Firefighters Association
               Contact: Marlene Bomar, President
               Telephone: 402.761.2211
               Email: mbomar@telebeep.com
               Website: www.nsvfa.org

               Nebraska Association of Air Medical Services
               Contact: Dan Duncan
               Telephone: 402.610.1271
               Email: dan.duncan@airmethods.com
               Website: www.neaams.org

               Children’s Hospital and Medical Center
               Contact: Megan Sorensen
               Telephone: 402.955.5146
               Email: mesorensen@childrensomaha.org
               Website: www.childrensomaha.org/transport5
b. Composition of the group and approximate number of members in Nebraska

Emergency Medical Services throughout Nebraska are provided by both paid and volunteer EMS agencies. As of February 2018 there are a total of 421 licensed ambulance services in Nebraska; 319 Basic Life Support (BLS), and 102 Advanced Life Support (ALS). EMS Education programs are also approved to provide EMS education in Nebraska by the Department of Health and Human Services, adhering to National EMS Education Standards and Guidelines. Currently there are 20 approved EMS training programs in Nebraska. At the present time there are five different levels of EMS personnel licensure in Nebraska, including: 415 Emergency Medical Responders, 4,920 Emergency Medical Technicians, 24 Advanced EMTs, 62 Emergency Medical Technician-Intermediates, and 1,504 Paramedics.

c. Relationship of the group to the occupation dealt with in the application

The applicant group has been assembled to represent each major stakeholder interest throughout Nebraska. The request to engage in the Nebraska Credentialing Review Program occurred as a result of proposed legislation in the EMS Act before the Nebraska 105th Legislature, 2nd Session. Specific content related to critical care paramedics was removed from the bill following opposition from the nursing community, citing the proposal constituted an expansion of EMS scope of practice. Tim Wilson represents the Nebraska Office of Emergency Health Systems; Michael Miller represents the Nebraska Board of EMS; Debbie Von Seggern represents the Nebraska EMS Association; Marlene Bomar represents the Nebraska State Volunteer Firefighters Association; Dan Duncan represents the Nebraska Association of Air Medical Services; Megan Sorensen represents Children’s Hospital and Medical Center, a provider of critical care transportation; and Tom Townsend represents Medics at Home, a private EMS agency.

Other groups, Associations, or Organizations in Nebraska

2. Identify by title, address, telephone number, email address, and website of any other groups, associations, or organizations in Nebraska whose membership consists of any of the following:

a. Members of the same occupation or profession as that of the applicant group;

The applicant group represents stakeholders involved in the delivery and oversight of emergency medical services. In particular, the Nebraska Board of EMS has membership that includes emergency physicians and nursing. Most licensed EMS personnel in Nebraska are members of either the Nebraska EMS Association or the Nebraska State Volunteer Firefighters Association.

b. Members of the occupation dealt with in the application;
The occupation dealt with in the application is the same as that represented by the applicant group.

c. **Employers of the occupation dealt with in the application;**
EMS personnel work in a variety of settings and may work or volunteer for county government, municipal government, private not-for-profit ambulance services, private for-profit ambulance services, aeromedical transport agencies, hospitals, clinics, academic and industrial settings.

d. **Practitioners of the occupations similar to or working closely with members of the occupation dealt with in the application;**
There is a wide variety of practitioners and occupations working closely with EMS personnel including physicians, advanced practice nurses, nurses, physician assistants, fire department personnel (that may not hold an EMS license), and law enforcement officials.

Nebraska Medical Association
233 South 13th Street, Suite 1200
Lincoln, NE  68508-2091
402.474.4472
www.nebmed.org

Nebraska Chapter - American College of Emergency Physicians
C/O National ACEP
4950 West Royal Lane
Irving, TX  75063-2524
800.798.1822, Ext. 3312
www.neacep.org

Nebraska Hospital Association
3255 Salt Creek Circle, Suite 100
Lincoln, NE  68504-4778
402.742.8140
www.nebraskahospitals.org

Nebraska Academy of Physician Assistants
1111 Lincoln Mall, Suite 308
Lincoln, NE  68508
402.476.1528
www.nebraskapa.org

Nebraska Nurse Practitioners
P.O. Box 762
North Platte, NE  69103
402.450.6469
www.nebraskanp.org
e. Educators or trainers of prospective members of the occupation dealt with in the application;  
   There are currently 20 approved providers of EMS education in Nebraska (see Appendix ‘G’ for  
   list). In addition, courses for initial critical care education are accessible through a variety of  
   providers nationally.

f. Citizens familiar with or utilizing the services of the occupation dealt with in the application  
   (e.g., advocacy groups, patient rights groups, volunteer agencies for particular diseases or  
   conditions, etc.); and  
   Outside the medical and emergency services communities, it is not known what citizen groups  
   may have an interest in this application. Currently critical care paramedics are not recognized  
   or regulated in Nebraska.

g. Any other group that would have an interest in the application.  
   None we are aware of at this time.

Current Status of Credentials

3. If the profession is currently credentialed in Nebraska, provide the current scope of practice of this  
   occupation as set forth in state statutes. If a change in this scope of practice is being requested,  
   identify that change. This description of the desired scope of practice constitutes the proposal. The
application comprises the documentation and other materials that are provided in support of the proposal.

There is no current credential for a critical care paramedic in Nebraska.

4. If the profession is not currently credentialed in Nebraska, describe the proposed credential and the proposed scope of practice, and/or the proposed functions and procedures of the group to be reviewed. This description of the desired scope of practice and the proposed credential constitute the core of the proposal. Also, please describe how the proposal would be administered. The application comprises the documentation and other materials that are provided in support of the proposal.

Critical care transportation has developed over the past three decades to involve an expanded scope of practice for paramedics. Educational programs have been designed recognizing that paramedics need additional preparation and ongoing education to prepare and maintain advanced critical care during inter-facility transports, including performing advanced clinical patient assessments and providing invasive care beyond the standard scope of advanced prehospital care. Specialists trained with demonstrated competency is essential to the quality delivery of critical care transport. Current paramedic education, based upon national educational standards and guidelines, does not include necessary knowledge and skills to manage critical patients during a high-risk transfer.

There are many critical care education courses available, consisting of 80 or more additional education hours beyond a paramedic program, based on national education standards and guidelines. A framework used as a model for other levels of EMS providers, includes four inter-related aspects leading to safe clinical practice:

- Education - trained to do
- Certified - certified as competent
- Licensed - has been granted legal authority to practice
- Credentialed - has been authorized by physician medical director to perform role

The International Board of Specialty Certification (IBSC) does not believe paramedics should work in a critical care environment without being certified. The legal risk is exponentially increased without validation of clinical competency. Critical care paramedic certification targets competency at the mastery level of paramedic practice coupled with entry-level competency over the knowledge, skills and abilities contained within the critical care transport specialty. (Appendix F)

Raynovich, et al., (Air Medical Journal, 2013), convey the following from surveyed paramedics: “My employer removed mechanical vents due to bad outcomes secondary to 20 minutes of in-service training.” Another paramedic reports: “Most paramedics are pressured into transporting patients that they are not comfortable with.” Research has demonstrated that paramedics currently deliver medical care using equipment and medications at a level above their education and for which they are not certified, licensed, or credentialed to function (Appendix A). Critically ill or injured patients requiring transportation to or between specialty tertiary care centers will continue to grow, and the development of guidelines and standards are necessary for public protection.
The historical evolution of paramedicine has created a situation in which specialized practice is not well defined or accepted, yet as tertiary care centers provide highly sophisticated care to patients, specialists capable of transporting these patients is essential. The International Association of Flight and Critical Care Paramedics reports various policy approaches to EMS personnel involved in critical care transport:

- Critical Care Paramedic Licensure - 2 (Alaska and Connecticut)
- Critical Care Paramedic Certified - 1 (Colorado)
- Critical Care Paramedic Endorsement - 8 (Iowa, Kentucky, Massachusetts, Montana, New Hampshire, Oklahoma, Tennessee, and Wisconsin)
- Expanded Scope of Practice Designated - 3 (California, Michigan, and Pennsylvania)

Current education programs do not prepare paramedics for roles in critical care transport. Additional education and credentialing is necessary for safe practice in a critical care environment. Other health professions, including nursing and medicine have additional education, certification, and credentialing processes to function in critical care. While the scope of practice may vary slightly, the typical practice of a critical care paramedic includes the following:

- Advanced clinical patient assessment (analysis and synthesis of clinical information)
- Chest Tube Thoracostomy - acute insertion
- Transvenous or Epicardial Pacing (management of)
- Hemodynamic monitoring (pulmonary artery catheter, central venous pressure)
- Intra-aortic Balloon Pump monitoring
- Invasive Cardiac Assist Device monitoring
- Extracorporeal Membrane Oxygenation monitoring
- Venous Central Line - obtaining
- Arterial Line monitoring
- Intracranial Pressure monitoring
- Ventilators - multimodal, with blender, that are used on patients requiring pressure control, pressure support, or other advanced settings
- Radiology films
- Point of Care Ultrasound - FAST exams
- Obstetric Fetal Monitoring
- Polypharmacy - complex infusions

Nebraska is a geographically large, rural state that relies upon critical care specialists to care for critically ill and traumatized patients. Currently there is no framework in Nebraska to verify education, certification, licensure, or credentialing for personnel functioning in critical care. Ensuring public protection and safe, quality medical care is paramount. The Nebraska Board of EMS supports the development of statutes and regulations to formally recognize and provide oversight for EMS personnel engaged in critical care transport. This entails the following process:

- Successful completion of a Nebraska Board of EMS approved certification application
- Make application to Nebraska Licensure Unit
Critical Care Paramedic Credentialing Review

Occupational Functions

5. Describe in detail the functions typically performed by practitioners of this occupation, and identify what if any specific statutory limitations have been placed on these functions. If possible, explain why the Legislature created these restrictions.

Critical care transport paramedics are not currently recognized in Nebraska. Paramedics are involved in providing these necessary transportation functions, often during inter-facility transports when specialized services are not available at the patients current location. This may involve ground or aeromedical transportation services. Patients may be initially transported to a critical access or community hospital that does not have the capability to definitively treat a patient, or specialized transportation services may be requested directly to the scene of a medical or trauma event by EMS, usually when located in rural Nebraska with extended transport times.

There are no statutory limitations or restrictions on critical care transport, because it is not a recognized or regulated occupation. As a result, patients are potentially at risk due to a lack of consistent oversight and minimum education, certification, licensure, and credentialing requirements. Nebraska Model EMS Protocols do not address the critical care aspects of the patients being cared for during these transports.

6. Identify other occupations that perform some of the same functions or similar functions.

Critical care transport registered nurses are most often part of the critical care transport team. Most aeromedical teams include a registered nurse and paramedic. In some cases, the RNs may have advanced training as nurse practitioners or their doctor of nursing practice (DNP). Many RNs will also possess specialty certification as certified flight nurses (CFRN), critical care registered nurses (CCRN), certified transport registered nurse (CTRN) or certified emergency nurse (CEN). Less common, some critical care transport teams may involve respiratory therapists. Critical care transport programs require physician medical oversight.

7. What functions are unique to this occupation? What distinguishes this occupation from those identified in question 6?

The functions that are most unique to critical care transportation involve providing critical care medicine - emergent procedures and monitoring - in an out-of-hospital environment. Patients often present in highly unpredictable settings with little to no additional medical expertise, and conditions that may include extremes of weather. At scenes of motor vehicle collisions or agricultural rescues, scene and patient management may be complicated by the need for extrication. Furthermore, aeromedical transport must understand and address the issues of flight physiology and the impact altitude will have on patients. All of this care is provided in a highly autonomous practice setting, with minimal direct supervision.

Practitioner Supervision

8. Identify other occupations whose members regularly supervise members of this occupation, as well as other occupations whose members are regularly supervised by this occupation. Describe the nature of the supervision that occurs in each of these practice situations.
When modern emergency medical services (EMS) were first developed in the 1960s, active involvement of the medical community was essential. Today, EMS continues to engage physicians in the broad oversight of EMS delivery, with the primary role “to promote continuous quality improvement and patient centered delivery of medical care.” Furthermore, “the EMS medical director should be involved and integrated with all aspects of out of hospital health care delivery.” According to the National Association of EMS Physicians® (NAEMSP®), “Physician oversight of EMS is critical to the successful delivery of EMS in any environment.” In 2010, the American Board of Medical Specialties approved EMS as a recognized subspecialty of emergency medicine, and “a physician board-certified in EMS medicine is best prepared to provide physician oversight of EMS, serving in the role of EMS medical director.”


9. What actions, judgements, and procedures of this occupation can typically be carried out without supervision or orders? To what extent is this occupation, or portions of its practice, autonomous? As noted in item 8 above, all EMS practice is supervised by an EMS physician medical director, who “has complete authority for all aspects of patient care, including oversight and verification of provider competency and provider credentialing.” Clinical practice in EMS is predominantly autonomous during patient interaction, utilizing protocols or standard operating procedures. At the critical care paramedic level, clinicians operate with collaborative and accessible medical oversight, recognizing the need for autonomous decision-making, based on the critical nature of the patients encountered. Patients are assessed, diagnostics obtained and analyzed, and plans of care implemented with a set of protocol-driven guidelines. Critical care transport personnel engage in complex risk versus benefit analysis.

10. Approximately how many people are performing the functions of this occupation in Nebraska, or are presenting themselves as members of this occupation? To what extent are these people credentialed in Nebraska? Currently there is no credentialing process for critical care paramedics within Nebraska. Several medical transport providers that are engaged in critical care transport do so mostly by utilizing Nebraska licensed paramedics. Some of these paramedics may have completed additional education, often required by the employer, but there is no consistent educational requirement for a paramedic to engage in critical care transport. Furthermore, examinations for Flight Paramedic-Certified and Critical Care Paramedic-Certified, are available through the International Board of Specialty Certification, but not required in Nebraska. Due to a lack of regulatory oversight in Nebraska, there is no credentialing process for EMS personnel engaged in critical care transport.

According to information obtained from the International Board of Specialty Certification, there are 59 certified flight paramedics and four certified ground critical care paramedics listing Nebraska as their state of residence. Based on the current aeromedical services and agencies thought to be providing critical care transport, it is estimated there are approximately 125-150 critical care paramedics in Nebraska. Many other paramedics are likely involved in critical care transport with insufficient education and credentials.
Educational and Training Requirements

11. Describe the general level of education and training possessed by practitioners of this occupation, including any supervised internship or fieldwork required for credentialing. Typically, how is this education and training acquired?

There is no degree requirement in the United States for EMS personnel at any level. The states of Kansas, Oregon, and Texas require a minimum of an Associate’s degree to be licensed at the paramedic level. Paramedics are generally educated utilizing National Educational Standards and Guidelines, delivered in approximately 1,200 clock hours. Upon successful completion of a CAAHEP accredited paramedic program, candidates are eligible for the National Registry of EMTs, paramedic certification examination, the exam utilized for Nebraska licensure. Paramedics complete supervised hospital and ambulance internship with demonstrated competencies as established by the educational program. These competencies do not include the typical practice for a critical care paramedic.

Critical care paramedic education is available from a variety of educational providers, and in various formats. One of the first providers of critical care transport education, beginning in 1995, was developed by the University of Maryland Baltimore County (UMBC). The critical care emergency medical transport program was developed “in response to the growing need for qualified specialists in the area of critical care inter-facility transfer.” UMBCs course is offered at multiple sites across the country. Creighton University, beginning in 2007, offers both campus-based as well as a unique online critical care paramedic course. The online course requires a campus-based residency for completion of an invasive skills lab and complex critical care scenarios. Creighton’s course has had over 1,000 participants representing 45 states and several international participants.

While there is no standardized curriculum or National educational guidelines, the International Board of Specialty Certification provides a blueprint for content on its examination. Critical care education generally includes approximately 100-120 contact hours. In addition to didactic content, some courses, such as the course offered at Creighton University, requires completion of 36 hours of critical care (hospital-based) internship. In other instances, physician medical directors and other subject matter experts may provide in-depth training and an internal agency credentialing process for personnel involved in critical care transports.

Occupational Work Settings

12. Identify the work settings typical of this occupation (e.g., hospitals, private physicians’ offices, clinics, etc.) and identify the predominant practice situations of practitioners, including typical employers for practitioners not self-employed (e.g., private physician, dentist, optometrist, etc.).

Critical care paramedics work in a variety of clinical settings. Predominantly, critical care paramedics are utilized as members of collaborative teams responsible for transferring patients between healthcare facilities, when access to a higher level of specialized care is needed. For example, a critically ill patient may be taken to a rural critical access hospital in need of care beyond the capability of such a facility. A critical care transport team, often comprised of critical care RNs and paramedics, respond to the critical care access hospital and facilitate transfer of the patient, maintaining or autonomously implementing medically advanced care. Transportation of high acuity patients may
occur directly from the scene of a medical or trauma emergency to a tertiary care facility by ground
ambulance, rotor or fixed wing aircraft. Aeromedical critical care transports are often unique from
other EMS transport operations in the distance and time involved in the transportation of critically
unstable patients, often exceeding 100 miles, and an hour or more. Less common, is the use of critical
care paramedics working in hospital critical care environments.

13. Do practitioners routinely serve members of the general population? Are services frequently
restricted to certain segments of the population (e.g., senior citizens, pregnant women, etc.)? If so,
please specify the type of population served.

Critical care paramedics, as members of complex interdisciplinary healthcare teams, engage in the care
of patients of all ages, with a variety of medical conditions. Patients may include but are not limited to:
premature and critically unstable newborns, high-risk obstetrical patients, multi-system trauma
patients, cardiac, pulmonary, neurological, renal, toxicologic, infectious, and many other medical
patients.

14. Identify the typical reasons a person would have for using the services of a practitioner. Are there
specific illnesses, conditions or situations that would be likely to require the services of a
practitioner? If so, please specify.

Physicians, mid-level practitioners (inter-facility transfers), EMS and law enforcement (scene flights)
personnel typically contact critical care transport providers to request their services. There are many
reasons for a critical care transport, most notably the criticality of the patient’s presentation, and need
for a higher level of care during transport than typical or available EMS transport.

15. Identify the typical referral patterns to and from members of this occupational group. What are the
most common reasons for referral?

Physicians, mid-level practitioners (inter-facility transfers), EMS and law enforcement (scene flights)
personnel typically contact critical care transport providers to request their services. There are many
reasons for a critical care transport, most notably the criticality of the patient’s presentation, and need
for a higher level of care during transport than typical or available EMS transport.

16. Is a prescription or order from a practitioner of another health occupation necessary in order for
services to be provided?

A prescription is not required. Inter-facility transfers require coordination between the transferring
and receiving facilities, usually between a transferring and receiving physician. The mode of
transportation and the necessary care involved is typically coordinated by the transferring physician.
Ongoing care of the patient during transport by the critical care team is guided by the written
protocols developed and approved by the transporting agency’s physician medical director.

Continuing Education and Competency Evaluation

17. How is continuing competence of credentialed practitioners evaluated?

Continued competency of personnel involved in critical care transportation is the responsibility of the
physician medical director of the critical care transport program. Nebraska does not currently
recognize critical care paramedics with a defined scope of practice, and therefore, does not have consistent minimum continuing education or ongoing competency evaluation requirements.

18. What requirements must the practitioner meet before his or her credentials may be renewed?

Nebraska does not currently credential critical care paramedics, and therefore, does not have renewal requirements. If Nebraska develops a recognized credential for critical care paramedics, an example of renewal requirements may be adapted from the International Board of Specialty Certification requirements outlined below.

The International Board of Specialty Certification (IBSC) has two certifications for paramedics seeking recognition of their critical care knowledge and skills - the Certified Flight Paramedic (FP-C) and Critical Care Paramedic Certification (CCP-C). IBSC guidelines state that “continuing education must have a clear and direct application to the practice of flight and critical care medicine.” Of a required minimum of 100 hours of continuing education every four years, 75 hours must be in the clinical category, and 25 hours may come from operational or clinical categories. The clinical category is broadly described as content “focused on knowledge the paramedic can apply in providing direct care to an individual patient population.” Example topics include advanced pathophysiology, pharmacology, advanced airway and ventilation management, management of the trauma patient, burns, neurological emergencies, cardiopulmonary emergencies, toxicology, environmental emergencies, perinatal and pediatric emergencies, and flight physiology. The operational category is described as “professional practice of paramedicine and the overall emergency medical system. Example operational topics may include quality improvement systems, legal aspects of critical care transport, medical ethics, leadership and management, and emergency vehicle and flight operations.

Regulations in Other States

19. Identify other jurisdictions (states, territories, possessions, or the District of Columbia) wherein this occupation is currently regulated by the government, and the scopes of practice typically for this occupation in these jurisdictions.

The International Association of Flight and Critical Care Paramedics reports various policy approaches to regulating EMS personnel involved in critical care transport:

- Critical Care Paramedic **License** - 2 (Alaska and Connecticut)
- Critical Care Paramedic **Certified** - 1 (Colorado)
- Critical Care Paramedic **Endorsement** - 8 (Iowa, Kentucky, Massachusetts, Montana, New Hampshire, Oklahoma, Tennessee, and Wisconsin)
- Expanded Scope of Practice **Designated** - 3 (California, Michigan, and Pennsylvania)

Following are some of the scopes of practice by state:

**Tennessee:**

1. Provide patient care during transport and in special situations with such devices as are approved by the EMS Board.
2. Access existing and manage invasive lines such as but not limited to: Parenteral Internal Center Catheters (PICC), Hickman catheters, Portacaths, central, and arterial lines.
3. Initiate and manage ventilators.

4. Manage care of tracheostomy tubes.

5. Initiate and manage surgical airways and chest tubes.

6. Provide care for cardiac patients, with but not limited to, cardiac interventions and advanced therapeutic devices.

7. Perform and interpret 12-lead electrocardiograms.

Wisconsin:

1. Gastric Decompression - NG/OG Tube.

2. Intubation - Medication Assisted (paralytics) (RSI) [Requires 2 Paramedics at Patients Side]


6. CVP Line Monitoring.

7. Pericardiocentesis.


10. Administration of medications to those specified in the Scope of Practice to which an individual is licensed, certified or credentialed.


12. IV Pump - Multiple Channel.

13. PICC Line - Access and Use.


15. Chest Tube Insertion.


17. Immunizations.

Pennsylvania:


2. Biphasic positive airway pressure (BiPAP) for patients acutely on BiPAP for <48 hours.

3. Endotracheal Intubation - paralytic assisted rapid sequence induction (RSI).

4. Ventilators, transport - single or multi-modal, with or without blender, using volume control mode only, on patients >1 year of age with no anticipated need to actively titrate ventilator settings during transport.

5. Transvenous or Epicardial pacing, management of.

6. Hemodynamic monitoring/assist (pulmonary artery catheter, central venous pressure).

7. Intra-aortic balloon pump or invasive cardiac assist device or extracorporeal membrane oxygenation - monitoring/assist.

8. Thrombolytic therapy - initiation.

9. Sub-cutaneous indwelling catheters - access or existing catheters.

10. Arterial line - monitoring.


12. Enteral feeding devices, management of.


15. Intracranial pressure monitoring/assist.


**Colorado:**

2. Blood Chemistry Interpretation.
3. Rapid Sequence Intubation - Adult (age 13 & over).
4. Formulary of critical care medications.

**Iowa:**

2. Cricothyrotomy - Surgical.
5. Hemodynamic Monitoring (including arterial line).
6. ICP Monitoring.
8. Intra-aortic balloon pump (monitoring/timing).

**Montana:**

1. Interpret chemistry and laboratory studies.
2. Drawing an arterial blood gas.
3. Ventilators.
4. Rapid sequence intubation - paralytics.
5. Surgical cricothyrotomy.
7. Expanded pharmacology formulary.
8. Nasogastric and orogastric tube insertion.
9. Urinary catheter insertion.
10. Accessing and maintaining various arterial and venous access devices.
11. ICP monitoring.

A national survey sent to 1,991 randomly selected nationally registered paramedics, with 610 respondents, sought to explore critical care transportation by paramedics. *Critical Care Transportation by Paramedic: A Cross-section Survey*, reports research results that offers insight into the scopes of practice seen in critical care transport (Raynovich, et al., *Air Medical Journal*, 2013). Paramedics report performing the following skills:

1. 12-lead ECG
2. IV Infusion pumps
3. Mechanical ventilator
4. Central line
5. Chest tube
6. Invasive pacemaker
7. Arterial line
8. Hemodynamic monitoring
9. Neonatal isolette
10. Intra-aortic balloon pump
11. ICP monitoring

Classifications of medications administered during critical care transports includes:

1. Analgesics
2. Vasopressors
3. Vasodilators
4. Chemical paralytics
5. Blood and blood products
6. Thrombolytics

Collectively, this information provides a broad overview of the types of competencies necessary for safe critical care transportation.

Additional Questions about this Proposal

1. What is the problem created by not regulating the health professional group under review, or by not changing the scope of practice of the professional group under review?

   Many states have recognized the need to expand regulatory oversight for critical care transportation, establishing minimum education requirements, an enhanced scope of practice for paramedics engaged in critical care transportation and ongoing continuing education to maintain competency. All of these initiatives are to protect the high acuity patients being cared for during critical care transport. Nebraska has an opportunity to establish minimum standards for critical care transportation, and recognize the specialty care needed by patients in this care environment. As healthcare becomes increasingly sophisticated with specialty care centers, the anticipated need for critical care transport paramedics will increase. In addition, there are advancements in pre-hospital care, such as mobile CT scanning, FAST exam ultrasound, and i-STAT lab testing, that will require minimum standards be established. Critical Access Hospital (CAH) providers are starting to rely more on Critical Care transport to arrive and assist with patient care because these transport teams have more experience with critical patients or have equipment that CAH may not have.

2. If the proposal is for the regulation of a health professional group not previously regulated, all feasible methods of regulation, including those methods listed below, and the impact of such methods on the public, must be considered. For each of the following evaluate the feasibility of applying it to the profession and the extent to which the regulatory method would protect the public.
   a. Inspection requirements
The Nebraska Department of Health and Human Services, Emergency Health Systems, currently conducts inspections for compliance with ALS transport provider status. These inspections would continue and provide enhanced criteria for those performing critical care transportation services.

b. **Injunctive relief**

Court ordered action is not necessary to address professional regulation in this instance. Development of statutes and subsequent promulgation of rules and regulations will achieve necessary oversight.

c. **Regulating the business enterprise rather than individual providers**

Emergency Medical Services are currently structured to regulate both service and individual provider responsibilities. Critical care transportation would involve regulation of the transportation agency and the individual care provider. Such a model is common throughout healthcare. Hospital and clinics are regulated as are the professional care providers working within these organizations.

d. **Regulating or modifying the regulation of those who supervise the providers under review**

It is the intent of the Nebraska Credentialing Review Program to help determine the need for additional professional regulation. This application supports and recognizes the need to proactively regulate those involved in critical care transportation to minimum standards, based upon current medical evidence.

e. **Registering the providers under review**

Not applicable.

f. **Certifying the providers under review by the State of Nebraska**

The applicants would prefer to utilize an endorsement process to regulate critical care transport providers and personnel in Nebraska. The Nebraska Uniform Credentialing Act does not have a provision allowing for endorsement. Registration, Certification, or Licensure are the options available to the applicant group.

In Nebraska, certification (71-6206) is defined as: “Certificate or certification shall mean a voluntary process by which a statutory regulatory entity grants recognition to an individual who has met certain prerequisite qualifications specified by such regulatory entity and who may assume or use certified in the title of designation to perform prescribed tasks.” Certification provides a means to require minimum standards for education, rendering of critical care transportation services, establishment of ongoing competency requirements, and holds practitioners accountable to standards of professional conduct.

g. **Licensing the providers under review**

Not applicable.

3. **What is the benefit to the public of regulating the health profession group under review or changing the scope of practice of the regulated health profession under review?**

Currently there are no minimum standards governing the provision of critical care transportation services within Nebraska. As a result, patients may be receiving disparate care. Critical care transportation personnel do not have any oversight regarding minimum education standards, or continuing education. Furthermore, personnel are restricted by the current paramedic level scope of practice, or may be functioning beyond the scope of practice, without any regulation to hold services or care providers accountable. For those patients and families in need of critical care transportation
services in Nebraska, they should be afforded providers who have met minimum standards in the interest of their health and safety.

4. **What is the extent to which the proposed regulation or the proposed change in scope of practice might harm the public?**

The proposed regulation and development of a critical care paramedic scope of practice seeks to prevent harm to the public. Failing to support the development of statutes and rules and regulations to credential critical transport providers increases the potential harm to the citizens of Nebraska, especially given the criticality of the patients encountered by critical care transport providers.

5. **What standards exist or are proposed to ensure that a practitioner of the health professional group under review would maintain competency?**

The International Board of Specialty Certification (IBSC) has two certifications for paramedics seeking recognition of their critical care knowledge and skills - the Certified Flight Paramedic (FP-C) and Critical Care Paramedic Certification (CCP-C). IBSC guidelines state that “continuing education must have a clear and direct application to the practice of flight and critical care medicine.” Of a required minimum of 100 hours of continuing education every four years, 75 hours must be in the clinical category, and 25 hours may come from operational or clinical categories. The clinical category is broadly described as content “focused on knowledge the paramedic can apply in providing direct care to an individual patient population.” Example topics include advanced pathophysiology, pharmacology, advanced airway and ventilation management, management of the trauma patient, burns, neurological emergencies, cardiopulmonary emergencies, toxicology, environmental emergencies, perinatal and pediatric emergencies, and flight physiology. The operational category is described as “professional practice of paramedicine and the overall emergency medical system. Example operational topics may include quality improvement systems, legal aspects of critical care transport, medical ethics, leadership and management, and emergency vehicle and flight operations.

Under the Nebraska Uniform Credentialing Act, Nebraska would credential these individuals just as is currently done for paramedics who are certified by the National Registry of EMTs by requiring credentialing by IBSC. To maintain this credential, applications must maintain their IBSC certification.

6. **What is the current and proposed role and availability of third-party reimbursement for the services provided by the health professional group under review?**

The Centers for Medicare and Medicaid Services recognize and reimburse for specialty medical transportation services. Medicare defines specialty care transport (SCT) as the interfacility transportation of a critically injured or ill beneficiary by a ground ambulance vehicle, including the provision of medically necessary supplies and services, at a level of service beyond the scope of the paramedic. Billing procedures allow for coding of specialty care transport that are recognized by the Centers for Medicare and Medicaid Services, and other insurers, for remuneration. When utilizing aeromedical specialty care transport, service providers must demonstrate patients meet high acuity status, and/or have a time sensitive condition, necessitating such services. Separate fees are applicable for aeromedical transportation services.
7. What is the experience of other jurisdictions in regulating the practitioners affected by the proposal?

Identify appropriate statistics on complaints, describing actions taken, etc., by jurisdictions where the profession is regulated.

Other states were contacted to find the experiences that they have encountered by regulating this profession. To date, only one of them has responded. Tennessee advised that the lessons they have learned is to have the authority within statute and rules and regulations to set the minimum standards and scope of practice for the profession to ensure the safety of the public.

8. What are the expected costs of regulating the health professional group under review, including the impact of registration, certification, or licensure on the costs of services to the public? What are the expected costs to the state and to the general public of implementing the proposed legislation?

Emergency medical services are already regulated in Nebraska, though not at the critical care paramedic level. The infrastructure is in place that would minimize the impact of certifying critical care paramedics. Moreover, adding regulation through certification enhances public protection during the care and transportation of critically ill or injured patients in Nebraska. The Nebraska Department of Health and Human Services (DHHS), including the Emergency Health Systems program and Licensure Unit, currently regulate and license EMS services, personnel, and training programs. The Nebraska Board of EMS is composed of volunteer members who provide subject matter expertise, advising and collaborating with DHHS. Under the Nebraska UCA, the certification process would align with other EMS certification and licensure processes. Currently, no EMS personnel are assessed any fee for licensure, and it is expected to be the same for those seeking critical care paramedic certification.

Given the specialized nature of critical care transport, the number of personnel seeking certification is not expected to be more than 300. There would be negligible impact on personnel processing certification applications and investigations. Costs to the general public would not be affected. Those pursuing Critical Care Paramedic will have the cost of the class ($1,000 to $1,500) and the cost of ISBC Certification ($225 to $385). The ongoing costs will be maintain the continuing education and recertifying with the ISBC every four years.

9. Is there any additional information that would be useful to the technical committee members in their review of the proposal?

We do not have additional information to provide at this time.
Appendix

Appendix A: Critical Care Transportation by Paramedics: A Cross-sectional Survey
Critical Care Transportation by Paramedics: A Cross-sectional Survey

William Raynovich, NREMT-P, EdD, MPH, BS, Jason Hums, MS, David F. Stuhlmiller, MD, FACEP, CMTE, James D. Bramble, PhD, MPH, Ted Kasha, BS, and Kim Galt, PhD, PharmD

Abstract

Objective: The purpose of this study was to gather data from paramedics practicing in the critical care transport setting to guide development of the education, training, and clinical practices for certification as a critical care paramedic. Methods: A paper survey of 1991 randomly selected nationally registered (NREMT) paramedics was conducted. Nine paramedics with residences in small US Pacific Island territories were not included in the survey. Results: We received 610 responses (30.6%). Respondents that stated that they provided critical care transport services reported using pediatric skills and equipment the most and intracranial pressure monitoring the least. Paramedics served as the primary provider for pediatric patients (72.5%), 12-lead electrocardiogram (66.3%), intravenous infusion pump (76.7%), mechanical ventilator (66.9%), central line management (63.1%), and chest tube management (63.3%). Paramedics served in a team member capacity most often with neonatal isolette (71.8%), intra-aortic balloon pump (79.2%), and ICP monitoring (64.9%). The majority provided ground critical care transport (249) compared to 44 rotor-wing and 6 fixed-wing. Sixteen respondents reported serving as primary providers on combinations of ground, rotor-, and fixed-wing services.

Conclusion: Paramedics reported being the primary provider on the critical care transport team and performing skills while using equipment and administering medications that exceeded their education and training as paramedic and, at times, without the benefit of any additional education or training. National appreciation of this reality should spur development of standardized education, licensing or certification, and continuing education to prepare paramedics for their role as critical care medical providers.

Introduction

Because the Institute of Medicine has recommended regionalization of emergency health care, 'interfacility transfer of critically ill and injured patients is a current topic of discussion. There is no national consensus on the definition of critical care transport or on the appropriate configuration of medical providers to attend to the patient during transport. The 1986 Consolidated Omnibus Budget Reconciliation Act includes the Emergency Medical Treatment and Active Labor Act, which places the responsibility on the transferring hospital to ensure that the care provided to the patient during interfacility transport does not result in a reduction in the level of care; specifically, an “appropriate transfer” is one “in which the transfer is effected through qualified personnel and transportation equipment, as required including the use of necessary and medically appropriate life support measures during the transfer” (Section [c][2][D]). The phrase “qualified personnel and transportation equipment” is not further defined in law or regulation and is therefore open to interpretation. Certain hospital administrators and physicians have construed this to mean that it must send its own personnel with the patient. Some states have regulations regarding the medical providers and their scope of practice during interfacility transport, whereas other states have no such regulation and provide no guidance. The Centers for Medicare and Medicaid Services provides the following definition:

Specialty care transport (SCT) is the interfacility transport of a critically injured or ill beneficiary by a ground ambulance vehicle, including the provision of medically necessary supplies and services, at a level of service beyond the scope of the EMT [emergency medical technician]. Paramedic. SCT is necessary when a beneficiary’s condition requires ongoing care that must be furnished by one or more health professionals in an appropriate specialty area, for example, emergency or critical care nursing, emergency
The paramedic profession began almost 40 years ago, and, although applied differently in different locales, the paramedic as a component of emergency medical services (EMS) response to a 911 emergency call is well known in the United States. The scope of practice of the paramedic along with other EMS professionals was recently defined on the national level; however, this national scope of practice did not identify a level of paramedic serving in a critical care transport setting or any other setting beyond the scope of practice of a 911 EMS paramedic. In 2001, the National Flight Paramedic Association (now the International Association of Flight and Critical Care Paramedics) developed a voluntary certification for paramedics who transport patients by air medical transport; however, no nationally accepted standard curriculum or education exists to train paramedics to provide critical medical care. Such education exceeds that of the National Highway Traffic Safety Administration National Standard Curriculum or National EMS Core Content.

No systematic review of the practice of paramedic interfacility critical care transport has been published. Thus, little is known about the prevalence, clinical practices, and the

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Critical Care Paramedic Credentialing Review
education and training of paramedics that provide critical care transport services.

In 2002, Hums conducted a convenience sample survey of paramedics who described themselves as providing critical transport services and described the skills and training that were commonly used during critical care transports. Most of the responders in that thesis served with an air medical transport service. The Hums thesis served as the foundation for this survey of nationally registered paramedics. The purposes of this study were to gather data from currently practicing paramedics to identify the prevalence of paramedics practicing in the critical care transport setting and document the scope of that practice to guide development of the education, training, and clinical practices needed for certification as a critical care paramedic.

Methods

The National Registry of Emergency Medical Technicians provided a random sample of 2,000 paramedics who had recertified at least one time in order to provide a representative sample of practicing paramedics in the United States. We excluded 9 paramedics who had US military or small island territory addresses and mailed 1,991 surveys by the US Postal Service. We used a modified Dillman survey method that included sending a postcard reminder a week after the initial mailing and then sending a replacement survey followed by a final postcard reminder approximately 3 weeks after the initial mailing to nonrespondents. A sample page from the survey instrument is displayed in Figure 1.

We asked paramedics about the principal modes of transport (eg, ground, rotor wing, ground and rotor wing, fixed wing, or a combination of these), their years practicing as a paramedic, their years practicing as a critical care transport provider, and whether they used separate protocols for critical care interfacility transports. If specific critical transport protocols existed, we asked if the protocols were statewide, regional, or agency specific.

We then asked 4 questions about each of the 12 skills and equipment and each of the 6 medications identified by the Hums thesis (Fig. 1). First, we asked the paramedic respondents to estimate the frequency they used each skill, equipment, and medication on a monthly basis: (1) less than 1 patient per month, (2) 1 to 5 patients per month, (3) 6 to 10 patients per month, and (4) greater than 10 patients per month. Second, we asked if the paramedics were the primary providers for the skills, equipment, and medications during transport or if the paramedics took the role of an ancillary member of the transport team. Third, we asked the paramedics to rate their comfort level in performing the skills, using the equipment, and administering the medications using the following 6-point Likert scale: 1 = very comfortable, 2 = comfortable, 3 = somewhat comfortable, 4 = somewhat
Table 1. Paramedic Years of Experience (N = 297)

<table>
<thead>
<tr>
<th>Years as a Paramedic</th>
<th>Years Practicing Critical Care Before as a Paramedic</th>
<th>Critical Care Provider Before as a Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.5</td>
<td>6.9</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>7.2</td>
<td>5.6</td>
</tr>
<tr>
<td>Range</td>
<td>1.5-38</td>
<td>0-26</td>
</tr>
</tbody>
</table>

Those who answered both years practicing and years as a critical care provider questions.

Table 2. Paramedic Median Skills and Equipment Use and Medication Use by Transport Mode

<table>
<thead>
<tr>
<th>Skills and Equipment</th>
<th>Ground Flight</th>
<th>Flight Transport (n = 249)</th>
<th>Flight Transport (n = 66)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>6.75</td>
<td>3.87</td>
<td>5.36</td>
</tr>
<tr>
<td>Significance (P value)</td>
<td>&lt; .0001</td>
<td>&lt; .0001</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

uncomfortable, 5 = uncomfortable, and 6 = very uncomfortable. Fourth, we asked if and where the paramedics obtained education or training to perform the skills, use the equipment, or administer the medications (eg, paramedic class, company/manufacturer in-service or orientation, continuing education classes, or no structured training).

We compared the comfort levels for each skill and equipment to the number of years that they had been providing critical care transports and compared their comfort level and their critical care training or education for each particular skill, equipment, or medication. To determine comfort levels by experience, we categorized experience levels as less than 3 years, 3 to 7 years, and more than 7 years. We then correlated their median comfort levels for each skill, equipment, or medication using a nonparametric Wilcoxon statistic and a Kruskal-Wallis analysis.

We used SPSS Version 17 (SPSS, Inc, Chicago, IL) to analyze relationships between the transport mode and paramedic years of experience and the frequency; role; comfort level; and education for each skill performed, equipment used, and medication administered. Finally, we asked the paramedics to indicate any additional skills, equipment, or medications routinely used during interfacility critical care transports that were not included in the survey and invited open comments.

Results

We received 610 completed surveys (a 30.6% response rate). Of the 610 respondents, 317 paramedics (52%) reported practicing in a critical care transport setting and comprise the study group. The geographic distribution of the study group is displayed in Figure 2. The majority of the study group identified themselves as ground critical care transport providers (249 [78.5%] ground; 44 [13.9%] rotor wing; 6 [1.9%] fixed wing; and 16 [5%] a combination of ground, rotor wing, and fixed wing services). Two respondents did not respond to this item. Study group paramedics had a mean of 11.5 years of paramedic experience and 6.9 years of experience providing critical care transports (Table 1). Although 95 (32%) of the paramedics reported having no experience as a paramedic before providing critical care transport, the median experience was 3 years and the mean was 4.6 years, with a maximum of 32 years of experience before providing critical care transport.

Paramedics who provided only ground critical care transport services reported administering fewer categories of medications and performing fewer procedures than those providing rotor wing or fixed wing transports. Table 2 shows that flight paramedics, on average, report having significantly more skills, equipment, and medication responsibilities than their counterparts who only provide ground transportation.

Paramedics reported using their pediatric skills and equipment the most (96.5%) and intracranial pressure monitoring...
and medications, paramedics serving as the primary provider reported increased comfort with managing chest tubes, arterial lines, invasive hemodynamic monitoring, intracranial pressure monitoring, IV infusion pump, neonatal isolette, invasive cardiac pacemaker, vasopressors, thrombolytics, vasodilators, and analgesics; however, the median comfort level difference reached statistical significance only for IV infusion pump and chest tube management (Table 5). For all skills, equipment and medications except for invasive cardiac pacemaker management, management of the pediatric patient, and vasopressors, continuing education was the most common source of training reported by practicing paramedics. Table 6 displays the percentage of paramedics serving as the primary provider who reported no education for the 18 individual skills, equipment, and medications included in the survey.

Paramedic respondents reported that intravenous insertion and infusion, management of left ventricular assist devices, antibiotic administration, magnesium sulfate administration, high-risk obstetric patient care, total parenteral nutrition administration, Foley catheter management, continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP) use, iSTAT testing (i-STAT® System; Abbott Laboratories, Abbott Park, IL), and rapid sequence induction intubation were additional skills, equipment, and medications that were not included in the survey.

Paramedic respondents were asked for open comments and those received included the following:

- "Would love more education to serve my patients."
- "If we have any questions about medications or procedures, the hospital will give an in-service prior to transport if we are uncomfortable with anything we can ask for additional personnel."
- "My employer removed mechanical vents due to bad outcomes secondary to 20 minutes of in-service training."
- "Most paramedics are pressured into transporting patients that they are not comfortable with."

Table 6. Percentages of paramedic roles and services by role (n = 317)

<table>
<thead>
<tr>
<th>Skill/Equipment</th>
<th>Primary Provider</th>
<th>Team Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal isolette</td>
<td>71.9</td>
<td>19.0</td>
</tr>
<tr>
<td>Central line</td>
<td>76.4</td>
<td>16.2</td>
</tr>
<tr>
<td>Chest tube</td>
<td>76.3</td>
<td>17.7</td>
</tr>
<tr>
<td>Invasive pacemaker</td>
<td>66.1</td>
<td>29.9</td>
</tr>
<tr>
<td>Arterial line</td>
<td>63.8</td>
<td>28.9</td>
</tr>
<tr>
<td>Hemodynamic monitoring</td>
<td>63.3</td>
<td>32.1</td>
</tr>
<tr>
<td>Neonatal isolette</td>
<td>58.1</td>
<td>35.5</td>
</tr>
<tr>
<td>Arterial line</td>
<td>47.6</td>
<td>41.5</td>
</tr>
<tr>
<td>Hemodynamic monitoring</td>
<td>39.4</td>
<td>52.8</td>
</tr>
<tr>
<td>Neonatal isolette</td>
<td>18.1</td>
<td>73.3</td>
</tr>
<tr>
<td>IABP (n = 93)</td>
<td>20.4</td>
<td>77.4</td>
</tr>
<tr>
<td>ICP monitoring</td>
<td>26.1</td>
<td>65.2</td>
</tr>
</tbody>
</table>

**ECG = electrocardiogram; ICP = intracranial pressure. Percentages do not add up to 100% because some respondents chose not to answer the question, and others reported performing the role both as a primary and as a team member.**

Table 4. Medications Administered by Paramedics during Critical Care Transports (n = 317)

<table>
<thead>
<tr>
<th>Paramedics that</th>
<th>Administer (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics</td>
<td>91.5</td>
</tr>
<tr>
<td>Vasopressors</td>
<td>74.1</td>
</tr>
<tr>
<td>Vasodilators</td>
<td>71.6</td>
</tr>
<tr>
<td>Chemical paralytics</td>
<td>67.5</td>
</tr>
<tr>
<td>Blood and products</td>
<td>63.1</td>
</tr>
<tr>
<td>Thrombolytics</td>
<td>47.9</td>
</tr>
</tbody>
</table>

The least (21.8%) during critical care transport (Fig. 3). Paramedics served as a primary care provider for a 12-lead electrocardiogram (76.4%), intravenous (IV) infusion pump (76.3%), pediatric patients (71.9%), mechanical ventilator (66.1%), central line management (63.8%), and chest tube management (63.3%). Paramedics served in a team member capacity most often with an intra-aortic balloon pump (IABP) (77.4%), neonatal isolette (73.3%), and intracranial pressure monitoring (65.2%) (Table 3). Of the 12 skills and equipment items on the survey, the median number of skills and equipment used per study paramedic is 7. Table 4 displays the frequency that paramedics administer critical care medications.

Of those paramedics who primarily provide only ground critical care transportation, 21.7% reported that they performed IABP, whereas 44.1% performed arterial line management. For paramedics who provide rotor wing or fixed wing critical care transport, 61.2% performed IABP monitoring, and 38.8% performed arterial line management. Chi-square analysis showed a significant relationship (P < .001) between the paramedic’s flight status and skills with relationship to IABP and arterial line management.

When comparing those paramedics with some education with those with no education for the 18 skills and equipment...
Critical care represents a higher level of medical care than is provided in other areas of health care. In the hospital setting, critical care physicians and nurses complete additional education before working in this setting. Physicians complete critical care fellowships, whereas nurses have Critical Care Registered Nurse courses and certification. In contrast, paramedics have no such standardized or accepted educational pathway, in part, because few in medicine appreciate the prevalence of paramedics delivering this level of care.

Because adverse events have been documented during interfacility transport in the United States and other countries, upwards of 34% in 1 United States study, hospitals began to develop their own critical care transport teams. Gebremichael et al described a hospital-based "mobile intensive care unit" staffed by a physician, nurse, respiratory therapist, and driver who successfully performed ground transports of patients with respiratory failure over 2 years where patients were stabilized before transport by procedures and transfusions rather than going and treating during transport and described their experience. The United States Air Force appreciated the benefit of specially trained transport medicine personnel and developed the Critical Care Aeromedical Transport Team in 1994 after Operation Desert.
Storm where a physician specializing in critical care, pulmonology, anesthesiology, or emergency medicine; a critical care nurse; and a respiratory therapist together transported critical patients and subsequently achieved a less than 1% mortality for patients evacuated from Afghanistan. Venkataraman et al Wrote that the medical care during the interfacility transport of children must meet or exceed the level provided by the referring hospital; medical ethics compel that the level of care must be maintained. These authors opined that the transporting care providers must practice in either the receiving hospital or the referring hospital or they do not belong on the interfacility transport team. Subsequent studies showed an improved outcome for pediatric patients transported by a specialized pediatric critical care transport team in the Netherlands and the United States. None of these studies address the paramedic as a critical care provider.

Studies in the United Kingdom and the Netherlands have found improved outcomes with specialized interfacility transport teams for critically ill or injured adult patients. An attempted meta-analysis of all studies regarding the impact of a specialized critical care transport team concluded that significant bias exists in the current literature and that more study is needed.  

At the turn of the 21st century, authors acknowledged that few physicians understand or appreciate either the unique practice environment of medical transport or the qualifications of medical attendants during transport and that patients benefit from specialized medical personnel during critical care transport, however, the authors do not suggest an ideal medical crew configuration. Although physicians attend to patients in an out-of-hospital setting in Europe, studies on the value of a physician on critical care transports in the United States yield variable results. In 2004, the American College of Critical Care Medicine published guidelines for interhospital critical care transport and recommended that a physician or nurse with additional transport medicine training should be the team leader while a paramedic may be the team leader for critical but stable patients.  

Our study revealed that 52% of paramedic respondents reported practicing as critical care providers, 96.5% of the study group paramedics reported they participated in pediatric critical care transports, and 71.9% reported being the primary provider. The role of the paramedic as the critical care transport medicine provider for adults and children must be acknowledged. A paradigm shift is needed to incorporate the paramedic into the regional health care system.
delivery system. Even in our study, only 68.5% of the study group paramedics reported that their own EMS service considered critical care transport as described previously and beyond the standard 911 advanced life support scope of practice. Moreover, paramedics reported they are the primary health care provider in charge for all of the surveyed skills, equipment, and medications during the critical care interfacility transports (Table 6); yet, 32% of respondents reported no experience as a paramedic before providing critical care to patients during interfacility transport. Paramedic education neither prepares the new paramedic for critical care transports nor is intended to provide this education. With the exception of IABP, for every skill, equipment, and medication in the survey, there was a least 1 paramedic as the primary provider that reported no education or training for that medical care; absence of training ranged from 0.4% for 12-lead electrocardiogram to 14.3% for neonatal isolette transports.

Few published studies address the role of paramedics during critical care transports. A prospective study by MacDonald has shown that specially trained paramedics can transport IABP-dependent patients to tertiary care facilities and can safely and appropriately manage complications during these transports.

The critical care paramedic was not defined in the EMS Scope of Practice model published in 2007 by National Highway Traffic Safety Administration; yet, our study shows that paramedics currently deliver medical care using equipment and medications at a level above their education and training. With regionalization of emergency medical care on the horizon, national guidelines and standards for the interfacility transport of critically ill and injured adults and children in the United States will need to be developed and must acknowledge the role of paramedics performing these critical care transports. National guidelines need to be developed regarding the necessary education, skills, training, and experience of paramedics before practicing as a critical care paramedic.

Limitations

Selection bias may exist because the overall response rate was 30%. A follow-up telephone study of the characteristics of nonrespondents was not conducted; however, there were no discernible categoric patterns or regional trends in responders and nonresponders.

Multiple personnel from the same organization may have completed the survey; however, the broad demographic distribution of the responders shown in Figure 2 suggests that any effect caused by multiple responders from a single agency would be minimal if it occurred at all. This survey is based on self-reported data, and there may be a self-report bias with regards to an individual’s perception of the skills, medications, frequency, comfort level, and so on. Because only 1.9% of the respondents practicing as a transporting paramedic indicated that they function primarily on a fixed wing aircraft, no specific conclusions related to this mode of transport can be drawn because of the small sample size. This study did not intend to explore or define an ideal critical care transport medicine crew configuration.

Conclusions

Paramedics are often the primary provider on the critical care transport team and are performing skills, using equipment, and administering medications beyond their education, training, and scope of practice as a 911 EMS response paramedic. National guidelines are needed for critical care paramedic education, training, and scope of practice.

References

Appendix B: Paramedic Specialization: A Strategy for Better Out-of-Hospital Care
Abstract
Demographic, economic, and political forces are driving significant change in the US health care system. Paramedics are a health profession currently providing advanced emergency care and medical transportation throughout the United States. As the health care system demands more team-based care in nonacute, community, interfacility, and tactical response settings, specialized paramedic practitioners could be a valuable and well-positioned resource to meet these needs. Currently, there is limited support for specialty certifications that demand appropriate education, training, or experience standards before specialized practice by paramedics. A fragmented approach to specialty paramedic practice currently exists across our country in which states, regulators, nonprofit organizations, and other health care professions influence and regulate the practice of paramedicine. Multiple other medical professions, however, have already developed effective systems over the last century that can be easily adapted to the practice of paramedicine. Paramedic practitioners need to organize a profession-based specialty board to organize and standardize a specialty certification system that can be used on a national level.

The Challenge
Health care in the United States has been characterized as a fragmented “nonsystem” with very high costs, significant inefficiencies, and disappointing outcomes.1 As a result of both rising costs and the reforms initiated by the Patient Protection and Affordable Care Act, it is anticipated that team-based care by a variety of health professionals in nonacute care settings will increase.2 Among the health care professions, there is significant variability in educational preparation and ongoing controversy over the scope of practice boundaries between various groups of health professionals.3 Because of rising health care costs driven by an aging populace and rising costs in acute care services, however, a more cost-effective deployment of nonphysician health care professionals in the out-of-hospital environment will be required, especially considering the lack of primary care resources in many areas. Currently, a significant amount of health care costs are driven by hospital services, many of which could be reduced or avoided by improved management of chronic care in the community, more accessible and appropriate evaluation and resolution of unscheduled needs for care, regionalization of emergency services, and a reduction in hospital readmissions. More accessible and appropriate evaluation and resolution of unscheduled needs for care offer the promise of rerouting the estimated 15% of emergency medical service (EMS) transports to the emergency department for nonemergent conditions and are estimated to save $283 to $586 million per year.4 Likewise, regionalization of care at designated specialty centers, including both EMS and transportation components, has been shown to reduce mortality and long-term disability in patients with time-sensitive acute care conditions, including trauma, ST-segment elevation myocardial infarction, stroke, and sepsis.5 6 However, these opportunities to improve outcomes depend on a competent, coordinated, 24/7 accessible network of community-based clinicians and transportation resources capable of providing a range of scheduled and unscheduled care service. Paramedics with specialty training may be what is needed in most communities to integrate existing resources through the use of practitioners already located within the EMS and air and ground medical transportation systems.

Could EMS Providers Play a Role?
Virtualy all communities have a local EMS system, and many have developed regionalized air and ground medical transportation systems based on regional acute and emergency transportation needs. These services are provided by a combination of paid and volunteer providers working in fire department, hospital-based, local government, or nongovernmental organizations that offer universally accessible 24/7 health care to the vast majority of the US population. These systems also maintain or work with dispatch centers capable of prioritizing requests for service, tracking the availability of resources, and accessing additional resources from adjacent communities when requests for service exceed capacity. A number of authors have proposed that the EMS system could play a meaningful role in the coordination and delivery of mobile integrated health care within communities and is an integral resource for the regionalization of care.7 8 9 However, these roles will require an EMS workforce that has a variety of new specialized skills built on the existing emergency care educational model.

Overview of EMS
EMS in the United States has existed in its current form for more than 4 decades. In 2011, an estimated 203,000 paramedics were credentialed in the United States by various state and territorial jurisdictions.10 In October 2013, it was further reported that almost 80,000 paramedics were currently certified by the National Registry of Emergency Medical Technicians (NREMT), a nongovernmental national certification organization. Although it is unknown how many of those paramedics have obtained or use additional specialized knowledge to enhance their practice beyond traditional emergency response activities, paramedic practitioners have been historically involved in a number of specialty areas including critical care transport,11 tactical EMS, military, wilderness medical care, and occupational medicine. In addition to these areas, significant efforts are now being undertaken to better understand and develop the paramedic role in primary care, particularly as it relates to mobile health care, community paramedicine, and
home health services. Many of these areas of specialization require knowledge and skills that are beyond the scope of typical paramedic education and practice. For the paramedic to perform effectively in these areas and to ensure the public is protected from harm, a comprehensive and uniform national approach to paramedic specialization is required. Many states have individually addressed specialized EMS practice issues through the regulation of education, scope of practice, or physician medical direction; however, these efforts remain parochial and uncoordinated. It is time now for paramedicine practitioners to embrace the development of a comprehensive and professionally driven specialty certification system that can be effectively used by EMS and transport services, policy makers, regulators, fellow health care providers, and the public. A formalized, specialty certification system will serve to define and validate the expertise required for paramedics to safely and effectively perform at the highest levels of paramedicine and should be modeled after similar efforts already undertaken by other health professions.

The publication of Accidental Death and Disability, The Neglected Disease of Modern Society in 1966 by the National Academy of Sciences is widely credited as the foundation of modern EMS in the United States. Subsequent efforts to organize EMS delivery led to a Presidential Commission on Highway Traffic Safety that, in 1969, recommended the creation of a national certification agency to establish uniform standards for training and examination of personnel active in the delivery of emergency ambulance service. Acting on that recommendation, the NREMT was founded in 1970. Contemporaneously to these events, a number of localities began piloting paramedic or mobile intensive care programs to advance the level of EMS care within their communities. After the passage of the federal EMS Systems Act of 1973, states were encouraged to develop licensing programs for EMS personnel. Although the terms “licensing” and “certification” have been used interchangeably and argued for many years, EMS providers are generally required to be certified as competent either before or during the process of obtaining a state license, sometimes called a state certificate, and before beginning practice. The paramedic education and certification process arose 35 years ago from a national curriculum developed by leading EMS agencies and the University of Pittsburgh. The National Standard Paramedic Curriculum was revised by the US Department of Transportation in 1998, and the current National EMS Education Standards for paramedics were completed in 2009. As of 2013, the NREMT, a national independent organization that implements and maintains uniform requirements for the entry-level certification and recertification of all levels of EMS practitioners, is recognized as a component of licensing in 46 states. The NREMT, however, does not offer certification in any specialty.

In 1996, the National Highway Traffic Safety Administration published a consensus document intended to guide the future development of EMS entitled “The EMS Agenda for the Future”. From this work came the “EMS Education Agenda for the Future: A Systems Approach”. A collection of documents were subsequently published by the National Highway Traffic Safety Administration NHTSA including the “National EMS Core Content”, the “National EMS Scope of Practice Model”, and the “National EMS Education Standards.” These documents collectively provide the basis for the scope of practice and educational requirements for paramedics. In conjunction with the development of these documents, “The EMS Agenda for the Future” noted a disconnect between EMS education and formal higher education systems. “The EMS Agenda for the Future” further called for the universal accreditation of EMS educational programs. Although not yet fully implemented, the NREMT requires that applicants seeking NREMT certification as paramedics must have completed an educational program accredited by the Commission on Accreditation for the EMS Professions (CoAEMSP). Most paramedic programs currently involve 2 to 4 semesters of college-level courses with associated clinical and field practica. Despite the fact that most paramedic education already includes, or is eligible for, college credit, currently no state nor the NREMT requires a college degree at any level as a condition for national certification.

An EMS practitioner’s scope of practice varies significantly between states and may include a formal list of allowed assessments, procedures, and medications. EMS practice in the United States has also historically required close supervision of the practitioner by a physician. In many instances, this supervision is more direct than that seen in other allied health professions. In a few cases, state credentialing may be dependent on an individual supervision agreement between a paramedic and a physician. One justification for this degree of oversight has been the reluctance on the part of the EMS community to accept the rigor of formal education and/or degree requirements that are common in other health professions such as nursing and respiratory therapy with associated broader scopes of practice. Despite the fact that specialized EMS practice has existed for many decades, formalized systems to educate, certify, license, and regulate these specialized paramedic providers have only begun to evolve. Although the few existing certifications continue to gain acceptance among air and ground specialty transport programs and their accrediting bodies, they have yet to gain widespread acceptance within the state regulatory community. This disconnect between paramedics currently practicing as specialists and regulators most certainly is multifactorial in etiology. In many instances, medical directors are afforded a high degree of latitude in determining functional scope of practice, likely contributing to the perceived lack of need for specialty certification. Additional causes are best illustrated through discussion of the evolution of specialty practice in other health professions.
Could Specialization Improve the Quality of EMS Practice?

Although not all specialized environments a paramedic might practice in require substantial additional education, training, or certification and some areas of specialization lie outside of the domain of paramedicine, it is clear that many specialty areas do exist and that the established EMS education, certification, and state licensing systems have generally avoided specialization. The NREMT has also considered specialization at multiple points in the last decade but has to date elected not to develop specialty certification examinations. Unlike other health professions such as nursing that provide a broad educational foundation, paramedicine practice has almost exclusively been developed to address initial prehospital response to acute illness and injury without expanding into the continuum of out-of-hospital health care. Virtually no mention is made of advanced or specialized paramedic practice areas in the formative industry documents including the EMS Act of 1973, the 1996 “EMS Agenda for the Future,” the 2006 Institute of Medicine report “Emergency Medical Services at the Crossroads,” the 2007 “National EMS Scope of Practice Model,” or the “National EMS Education Standards.”

The absence of current consensus in the educational, clinical, operational, and regulatory communities around paramedic specialization is likely the result of either inattention to the topic or overall ambiguity regarding specialized roles at the professional, state, and national levels. In recent years, priority has been placed on standardization and accreditation of traditional EMS education and credentialing nationwide that may have contributed to this disregard for formalization of specialty certification. What has been accomplished in the specialization area, however, has been the result of patchwork efforts by individual EMS organizations, a small number of states, and a handful of nonprofit organizations.

Should Specialization Only Be for Paramedics?

In the United States, the title “paramedic” is recognized as the highest level of credentialing paramedicine practitioners involved in EMS and medical transportation activities. Although some states may recognize and/or license additional levels, the 4 universally recognized provider levels in the National EMS Scope of Practice model in ascending order are emergency medical responder, emergency medical technician, advanced emergency medical technician, and paramedic. Each level represents an increasing breadth and depth of understanding of the treatment of acute injury and illness, and all of these practitioner levels can be considered participants in the practice of paramedicine. Any level of EMS provider may function in specialized environments, and some may be provided additional knowledge and/or allowed to perform additional skills in certain settings and in some jurisdictions. However, the recommendations for specialization described here are intended as a supplemental certification for practitioners already credentialed at the paramedic level.

Specialization in Other Health Professions

Specialization by physicians began to evolve in earnest in the 19th century and was a contentious topic in the United States well into the early 20th century. The American Medical Association opposed the listing of physician specialty interests in directories published by local medical societies throughout the 19th century on the grounds that general practice was the primary duty of physicians. Over time, the prevailing counterargument was that advancements in medical science and technology required specialization. This evolution of thought, combined with the adoption of comprehensive physician education requirements following the Flexner Report in the early 20th century, led to extensive improvement and standardization of physician training programs including the development of residency programs and certification examinations. The structure of the health care system in the United States, particularly the fee-for-service medical insurance programs that evolved in the mid-20th century, further rewarded most specialists with higher incomes. By the turn of the 21st century, almost all physicians completed specialized training after graduation from medical school. The American Board of Medical Specialties reports that 80% to 85% of licensed physicians in the United States are certified through 24 medical specialty boards responsible for over 150 specialties and subspecialties. Current standards for board certification as a physician include the following:

- Completion of 4 years of undergraduate premedical education at an accredited college or university
- Completion of a 4-year medical education program at a qualified medical school with a medical degree (MD or DO)
- Currently hold unrestricted license to practice in Canada or the United States
- Completion of a 3- to 5-year full-time residency program accredited by the Accreditation Council for Graduate Medical Education
- Pass a written and, in some cases, oral examination administered by an American Board of Medical Specialties member board

Unlike other countries, such as Germany, in which specialty certification systems are based solely on training and credentials, the American system evolved based on examination. EMS represents a new physician subspecialty introduced by the American Board of Emergency Medicine in 2010. As a new specialty that has not yet deployed a significant number of accredited EMS residency programs, 3 pathways to certification currently exist including the following:

- EMS practice pathway: demonstration of at least 400 hours of EMS practice per year over a minimum of 60 months as an EMS medical director, direct provider of prehospital care, or another EMS leadership role within the last 6 years
• EMS practice plus training pathway: successful completion of an EMS fellowship, which requires at least 400 hours of EMS practice per year over a minimum of 24 months as an EMS medical director, direct provider of prehospital care, or another EMS leadership role within the last 6 years
• EMS fellowship training pathway: completion of an EMS fellowship program accredited by the Accreditation Council for Graduate Medical Education

Completion of a board certification examination, developed by a 14-member committee and offered for the first time in October 2013, also will be required. These pathways to certification, created to accommodate active practitioners entering a new certification process, may provide a template for EMS practitioner specialty certification.

Nursing

One of the first articles discussing specialization in nursing appeared in 1900 and suggested that nurses could increase their level of knowledge in certain areas and supplement the work of specialized physicians. The American Board of Nursing Specialties (ABNS) was formed over 9 decades later in 1991 and, as of 2013, had a membership of 33 specialty nursing boards that administered 1 or more specialty certifications available to licensed registered nurses. Unlike physician specialties that widely use similar processes for certification of postgraduate specialists and subspecialists, the ABNS recognizes specialty certification programs that are available to any registered nurse (RN) as well as programs only available to advance practice nurses with graduate-level education. The ABNS standards further allow for some member boards to certify non-RN team members supervised by RNs. Recognition of a specialty is based on a number of criteria including but not limited to 1) evidence that the specialty exists from a professional and scientific standpoint, 2) a distinct body of scientific knowledge apart from basic nursing, 3) evidence of societal need, and 4) support for the specialty from national or international nursing organizations.

By way of example, the Board for Certification of Emergency Nurses (BCEN) currently offers certification programs for nurses practicing in emergency and transport areas to include certified emergency nurse, certified flight RN, and certified transport nurse. The BCEN also offers a certification in pediatric emergency nursing in collaboration with the Pediatric Nursing Certification Board. All BCEN certifications require an unrestricted nursing license from a US state or territory and successful completion of a written examination. The BCEN further recommends, but does not require, 2 years of experience in the specialty area.

The American Association of Critical-Care Nurses offers certification as a critical care RN, which is also recognized as a critical care nurse specialization. Critical care RN credentialing requires both successful completion of a didactic examination and clinical practice requirements, including minimum experience in specified clinical areas of practice.
although it is likely that many professional associations have had a hand in the development of many of these now independent boards.

Certification and Recertification

Although requirements related to training, education, residency, and/or experience may exist, all specialty certification programs noted previously require a written examination. In most cases, these examinations are delivered in a computer-based format through a variety of testing vendors. In rare instances, oral examinations also may be part of the certification process. One of the primary purposes of specialty certification boards is to develop the examinations and certification requirements. In most cases, examination development is done in conjunction with outside firms that specialize in examination development and validation. In all cases, however, the governing boards of specialists direct the body of knowledge to be examined, whereas subject matter experts, sometimes including the governing board members, develop the examination content.

In all of the specialty certification examination examples reviewed, a valid and unrestricted license within the domain of practice is required as a prerequisite to specialty certification. Additionally, a fee is charged for the initial certification and renewal of the certification. Associated costs range from over $100 to well over $1,000. These fees are in addition to any state-imposed fees necessary to maintain licensure.

Additionally, a recertification process exists for all of the professional specialization programs discussed previously. In almost all cases, recertification is available through examination and may include ongoing clinical practice requirements. A number of specialty boards allow for a “retired designation” for inactive, but previously certified, providers. Most specialty boards also offer various alternatives to reexamination, including continuing education, clinical practice, and other professional development requirements such as committee participation, quality improvement work, and similar activities.

Specialized Paramedic Certification Today

Currently, specialized paramedic practice has not been widely recognized or accepted by state regulatory agencies. There is also no universal agreement regarding whether specialization should be viewed as another practitioner level or as a specialty certification available to currently licensed practitioners. The only EMS-related specialty certification board, the Board for Critical Care Transport Paramedic Certification (BCCTPC), was formed in 1999 as an independent organization at the urging of the National Flight Paramedics Association (now the International Association of Flight and Critical Care Paramedics). The BCCTPC currently offers 3 certifications through a didactic written testing mechanism including the certified flight paramedic, the certified critical care paramedic for ground providers, and the certified tactical paramedic. No educational, experiential, or skills demonstra-
tion are currently required for these certifications. Two years of relevant clinical experience are recommended, and a valid state license is required.

Fourteen states recognize a critical care paramedic specialization through licensure, certification, endorsement, or an expanded scope authorization process. Only California has passed legislation to recognize the BCCTPC certification process as the basis for state licensure as a critical care paramedic. Similarly, the Montana Board of Medical Examiners has established requirements and issues a professional license to all levels of emergency medical technician practice in their state and uses the BCCTPC certification process to issue a critical care paramedic endorsement to an existing Montana paramedic license.

Few other paramedic specializations have been recognized officially. Minnesota, however, has recognized a community paramedic specialization process that includes experience, education, and medical direction requirements. However, the limited acceptance of paramedic specialization is not surprising because it has taken well over 3 decades for most states to accept the NREMT certification as the basis for initial state credentialing as an EMS practitioner.

Despite this lack of acceptance, a variety of programs have proliferated over the past 2 decades with the goal of providing specialized education to EMS practitioners. Many of these programs are 1 to 4 weeks in length and offer a certificate of completion issued by the educational provider. One of the most notable is the Critical Care Emergency Medical Transport Program, developed and franchised by the University of Maryland Baltimore County in the 1990s. A similar program, the Certified Intensive Care Paramedic Program, is available through the Cleveland Clinic. Both of these programs advertise that they prepare candidates for BCCTPC examination. EMS practitioners who have completed these programs often adopt these certificate credentials (Critical Care Emergency Medical Transport Program, Certified Intensive Care Paramedic Program, and so on). Despite the knowledge contained in these programs, it should be noted that none of these programs subject their curricula to external approval, nor are certificate holders subject to independent verification by examination. While providing excellent education, none are recognized by governmental or professional entities, and in most cases, are wholly controlled by their sponsoring organization as business ventures.

In addition to specialty certification and education programs, the supervised nature of EMS practice also requires oversight and/or approval by physician medical directors. Although requirements vary substantially between jurisdictions, it is likely that specialized paramedic practice requires active oversight by a physician including but not limited to clinical protocol development, direct online consultation requirements, and quality improvement initiatives. Based on the particular state regulations, additional approvals, including organizational licensure or accreditation, may be necessary to operate a program using specialized paramedics.
Role of State Regulation

Occupational licensing in the United States is within the purview of state governments. A patchwork of practitioner of licensing standards evolved throughout the 1970s, 80s, and 90s. In 1996, the "EMS Agenda for the Future" recommended that although states retain the responsibility for licensing, they should increase reliance on available national resources and nongovernmental organizations for certification and accreditation. Subsequent to this recommendation, a number of states have increased the use of NREMT certification for licensure purposes as well as CoAEMSP accreditation for paramedic education programs. The evolution of EMS education, certification, and licensure by state governments, however, places the field of paramedicine in sharp contrast to medicine, nursing, and other allied health professions. These groups developed profession-based, standardized educational requirements and primary certification programs that have subsequently been adopted by state governments as the basis of licensure. However, EMS professional requirements were created mostly by state governments with federal funding in the 1970s and 80s and developed either before or simultaneously with EMS professional organizations. This development of requirements on a state-by-state basis has disrupted and delayed the development of standardized professional certification processes and has likely inhibited professional development and workforce mobility. Considering that specialty certification in other health professions is almost universally avoided as a direct function of state licensing bodies in other health professions, it would be beneficial for state governments to also avoid specialty licensing within the realm of paramedicine. Unfortunately, however, a national, well-designed, and profession-based specialty certification program has not yet been developed or recognized as a mechanism to outline scope of practice, employer credentialing, and medical direction while providing for public protection. To the extent that specialization is regulated, it is often and appropriately confined to scope of practice regulation. Historically, however, it has been difficult for the EMS community to separate the concepts of core content, scope of practice, initial education, advanced education, dependent certification, state licensing, and organizational privileges. This confusion is likely the result of many state regulatory agencies having been placed in the position to develop and manage all of these system components as previously noted.

Recommendation for EMS Specialization

To better address the issue of paramedic specialty certification, EMS regulators should look to other areas of medicine as a model to establish the core content of specializations, define educational requirements, and provide specialty certifications. This approach should engage the profession itself as a partner to maintain public safety and would also serve as a driver to enhance the quality and accountability of care. As in other health professions, paramedicine must acknowledge that rapid advancements in medical science and technology will demand specialization to maintain care quality. An independent board of specialties within paramedicine should be empowered by the profession to serve as a multi-disciplinary board to review and approve core content for paramedic clinical specialties. Ideally, this board may further establish committees to administer certification of established clinical specialties and/or develop alliances with outside certification organizations providing specialty certifications in both clinical and nonclinical areas (i.e., EMS telecommunications, education, leadership, management, and so on). This board of paramedicine specialties should further ensure that certification programs meet the requirements established by the National Commission for Certifying Agencies. This board should work collaboratively with the NREMT as well as state and federal EMS officials to inform and guide these governing agencies regarding current and emerging specialty areas within paramedicine. Critically, this should occur in an independent manner driven by paramedicine practitioners. This board should be non-governmental and separate from the initial certification activities managed by NREMT. This board should be structured in a fashion similar to the American Board of Medical Specialties, the American Board of Nursing Specialties, or the American Board of Physical Therapy Specialties. The Canadian system of a provincial College of Paramedics may also serve as a guide in this area.

All candidates wishing to be board certified in a specialty area of paramedicine must be required to pass a rigorous, validated examination developed and administered by the respective certification committee or affiliated certification organization. All examinations should conform to the highest standards of professional certification and be validated by an independent certification organization. This examination process must not be marginalized by local or regional practice issues.

The board should develop appropriate and rigorous educational standards and experience requirements for candidates to further ensure the competence of board-eligible candidates. The absence of meaningful educational standards that include classroom, laboratory, and clinical experience components invites disruption and incongruity because states would likely attempt to apply their own parochial requirements in the absence of robust national standards. Such variability would serve only to diminish the validity and acceptance of specialty certification. Looking back to the NREMT example, the examination items tested for all levels of EMS provider are driven not by the NREMT themselves but rather by ongoing practice analysis and the National EMS Education Standards. Therefore, the board should work closely with other professional associations in paramedicine to develop education pathways to ensure that EMS providers obtain the necessary didactic and psychomotor skills to successfully secure specialty certification. Additionally, considering that most paramedic training programs are currently or soon to be accredited by CoAEMSP and almost universally offer college credit, the certification board should strongly consider the
enactment of academic degree requirements for specialty candidates. Such requirements provide educational credibility to the certification process and are similar to that of other allied health professions.

To ensure parity with other health care professions, this board should consider experience requirements for certification, such as those used by the BCEN. These experience requirements should be evaluated over time to determine if a formal residency or fellowship would be more appropriate, as is common in medical specialties and some allied health professions.

Perhaps, most importantly, states should refrain from creating additional licensure levels above the paramedic level. The addition of disparate licensure levels by states has already created disparities and confusion related to specialized practice that will likely only compound if new license levels proliferate. By contrast, state regulatory efforts should be focused on scope of practice concerns, and those efforts should align state regulations with the core content developed by specialty boards at the national level. A broad approach to the regulation of specialty practice at the state level would also be useful to limit conflicts with national standardization yet allow for medical directors and employers to exercise additional control through credentialing requirements. State governments should also be cautious in applying additional requirements for practice beyond standards adopted by the specialty board. In most allied health and medical professions, specialization is not the responsibility of state licensing agencies, and efforts in this area could lead to significant disruption. Employers and medical directors, by contrast, should enact requirements for specialty credentialing at the local or organizational level that could be used to grant privileges to practice as a specialist, which is common in health care.

This is not a structure that will develop in an instant. To institute permanent and lasting change for the paramedic profession, organizations that offer nonclinical specializations such as the National Association of EMS Educators, the Center for Public Safety Excellence, and the Association of Air Medical Services should consider affiliating their certification activities with the paramedicine specialties board. This will ensure cooperation and consistency within the profession as a whole, similar to the process used by the American Board of Nursing Specialties that spans a wide array of nursing specializations.

Summary

Paramedics across the United States currently are engaging in specialized practice areas that require substantial additional knowledge and experience than what can be expected from an entry-level practitioner who has completed initial paramedic education. The historic evolution of paramedicine has further created a situation in which specialized practice is not well-defined or accepted yet is demanded by advances in the science of medicine. Furthermore, federal and state governments have been placed in a position to substitute for the professional self-governance seen in medicine and many other health professions because of a variety of historic and political factors.

Appropriate regulation of specialized practice has developed over nearly 2 centuries. Although it is clear that specialty certification processes evolve slowly, there are many models in medicine, nursing, and other allied health professions for effective, safe, and standardized specialty education, examination, and practice. The Board for Critical Care Transport Paramedic Certification is an example of an organized and functional specialty board that could expand its mission to all specialties in paramedicine. The success of the certified flight paramedic has created a universally recognized means for medical professionals, employers, and the public to understand that paramedics holding this specialty certification have additional knowledge in the domain of paramedicine beyond that of an entry-level paramedic. The creation of 50 or more unique and disparate state schemes to address practice in specialty areas would further fragment paramedicine, stagnate the advancement of the profession, and perpetuate parochial jurisdictional barriers. A preferred approach would be the creation of a single, independent, profession-based, and collaborative board of paramedic specialties to administer the specialty certification process. Such an approach would serve to ensure public safety while advancing the status and service of paramedicine practitioners among their health care colleagues.

References


Critical Care Paramedic Credentialing Review


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Appendix C: Critical Care Paramedics--A Missing Component for Safe Interfacility Transport in the United States
Critical Care Paramedics—A Missing Component for Safe Interfacility Transport in the United States

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In today’s health care system, numerous forces have increased the need to transfer critically ill patients between medical facilities. In 2007, the Institute of Medicine recommended working toward an emergency care system with specialized care provided by expert regional centers. Today, accredited centers provide specialized care for complex and time-sensitive conditions such as major trauma, myocardial infarction, and stroke, and studies note that outcomes of some complex conditions are improved when care is provided at higher-volume centers. Additionally, health insurance plans and accountable care organizations are increasing financial incentives to repatriate their patients to contracted medical facilities. In early decades of emergency medical services (EMS) in the United States, when it was necessary for a community hospital to refer a patient to a more skilled medical facility, nurses—with varying levels of qualifications and experience—frequently accompanied the EMS providers during patient interfacility transport. In 1994, Wuerz and Meador provided one of the first studies of adverse events with this model. In a series of 351 ground interfacility transfers, 4.9% required advanced life support interventions, 3.7% received unanticipated medications, and 1 patient experienced a cardiac arrest.

In this month’s Annals, Singh et al provide a contemporary description of the rates of critical events and the need for rescue interventions during ground interfacility transport in a large Canadian critical care transport service. In their study of 5,144 interfacility transports, 1 in 15 patients experienced one of several defined critical events, including new hypotension, initiation of vasopressor therapy, and respiratory events. An important finding was that the rate of critical events was lower with transports staffed by specialized critical care paramedics than with those staffed by advanced practice paramedics. Although the study cannot verify a causal relationship, the observations by Singh et al highlight a potential benefit of using highly educated critical care paramedics specially trained for the complexities of interfacility transfer.

To understand the potential role of the critical care paramedic, one must recognize the various levels of EMS provider training and certification. In the United States, EMS provider levels are defined by the national scope of practice model as emergency medical responder, emergency medical technician (EMT), advanced EMT, and paramedic. EMS provider levels in the Canadian model include emergency medical responder, primary care paramedic (with a scope of practice between the US EMT and advanced EMT), advanced practice paramedic (the equivalent of paramedic in the United States), and critical care paramedic (a provider with additional advanced critical care knowledge and skills). Early drafts of the current US EMS national scope of practice included an advanced-level provider with knowledge and skills above those of a paramedic (akin to the critical care paramedic in the Canadian system), but this component was removed from the final model.

Although supporting data are limited, the concept of using specially trained critical care paramedics to manage interfacility transports is sensible and pragmatic. EMS care usually focuses on the emergency treatment of acute conditions, including the provision of acute lifesaving interventions, limiting secondary injury, and providing transportation to the nearest appropriate medical facility. However, interfacility transport often involves bridging ongoing critical care between 2 medical facilities. The National Highway Traffic Safety Administration “Guide for Interfacility Patient Transfer” suggests advanced airway skills, ventilator management, circulatory management, and advanced knowledge of vasoactive and antiarrhythmic drugs as important minimum competencies for these providers. Other commonly performed interfacility interventions include monitoring of arterial blood and central venous pressures, managing indwelling tubes and drains, and operation of cardiac assist devices. Furthermore, this complex care takes place within the confines of an ambulance, helicopter, or fixed-wing aircraft, and many encompass lengthy transports exceeding several hours. Conventional EMS and inhospital professionals in the United States are usually not prepared for the spectrum of clinical responsibilities in this setting.

Why do we need a national recognition of an advanced-level paramedic provider? The current lack of national standards has
resulted in state-level variations in terminology and scopes of practice. An unpublished 2010 survey of state EMS directors highlighted the range of terminology and defined roles for advanced paramedics. Of responses from 29 states and 2 territories, 14 had regulations specifically addressing ground interfacility transport, 11 licensed or otherwise regulated a level of ambulance service above paramedic-level care, and 10 licensed or otherwise recognized a level of advanced paramedic, using a range of terms such as “critical care paramedic,” “specialty care paramedic,” and “advanced practice paramedic” (personal communication, James DeTienne, National Association of State EMS Officials, January 2014). Without national standards for an advanced level of paramedic, states face challenges in accrediting educational institutes, developing and maintaining valid examinations to evaluate competence, and assessing equivalency when providing reciprocity of certification between states.

Technologic advances and the regionalization of health care will likely increase the need for interfacility transport of critically ill patients. In the United States, there is growing sentiment supporting the national recognition of advanced-level paramedics to facilitate interfacility transport. Further studies are certainly needed to build the evidence base to guide this model of care. However, the addition of a specially educated advanced-level provider to the national EMS scope of practice model may provide an important first step toward ensuring competent and safe care during interfacility transport of critically ill patients.

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REFERENCES

CORRECTION
In the May 2014 News and Perspective article, page 13A, the report on how multidisciplinary health care teams prepared for a mass casualty event, responded to it, and helped survivors rebuild their lives afterward was published by the Journal of Orthopaedic & Sports Physical Therapy (JOSPT) as well as The Journal of Bone and Joint Surgery (JBJS).
Education and Certification for Patient Transport

Eileen Frazer, RN, CMTE, Renee S. Holleran, FNP-BC, PhD, CEN, CCRN (emeritus), CFRN, CTRN (retired), FAEN

The 10th edition of the Commission on Accreditation of Medical Transport Systems (CAMTS) Accreditation Standards was published in October 2015. The publication of these standards coincided with the 25th anniversary of CAMTS. An integral part of these standards are the Orientation, Training, and Continuing Education Requirements for patient transport. In order to ensure and evaluate competent and safe patient care before, during, and after transport, these particular standards provide a framework for transport programs to develop orientation and ongoing education. It is important that the education and training of all transport members reflect the mission and scope of service of the transport program. The patients we transport and the colleagues we work with should expect nothing less than the best care possible when requiring our services.

The nurses, paramedics, and physicians involved in transport are part of a unique group of professionals. In addition to an outline for education, the 10th edition of the standards includes the certifications that are required for the professional practice of patient transport. A certification shows the achievement of knowledge and skills as well as a commitment to one’s profession. The achievement of a professional certification has been linked with patient satisfaction; nurse retention; and, in a recent study, a decrease in healthcare-associated infections in adult critical care.

The Education and Certification Matrix, which is contained in the 10th edition standards, offers an explanation of courses and certifications that are available from internationally recognized organizations. The specific certifications that are recognized by CAMTS were identified by the members of the CAMTS Board, who represent the multiple disciplines involved in patient transport.

Education

Initial and continuing education requirements in the accreditation standards for medical personnel include courses that have been developed and implemented by national and international associations. These courses are evaluated and updated as the science related to them changes. These courses are listed both in the body of the standards and in the Education and Certification Matrix. The mission statement and scope of care of the medical transport service will determine the education and competencies that are required.

CAMTS has been and is willing to review and approve equivalent education courses if a program chooses not to use a standardized course such as Advanced Cardiac Life Support, Advanced Trauma Life Support, or Transport Professional Advanced Trauma. However, these courses must be approved by the CAMTS Education Committee and should be submitted at least 6 months before submitting a PIF as a new applicant. These equivalent courses must include measurable learning objectives, offer the equivalent number of hours to the course that is being replaced, and include documentation of scores and evaluations at the completion of the course. There is a fee for review of each equivalent course.

Certifications

Certifications for nurses have been required since 2008. In 2012, this requirement was also added for paramedics. Certifications for nurse are noted in Table 1. These certification examinations are developed and administered by professional testing bodies such as the Board of Certification of Emergency Nursing. These examinations are based on research that identifies the knowledge and competencies that have been acknowledged as essential by nurses who are a part of the profession. These examinations are administered by professional associations, such as the Emergency Nurses Association, and the American Association of Critical Nurses, that outline the basic knowledge needed for the practice of these nursing specialties. These examinations are developed through a rigorous statistical analysis to ensure validity and reliability. Some of these examinations are available internationally.

For paramedics, there are currently only 2 advanced certifications available: Certified Flight Paramedic or Certified Critical Care Paramedic. These certifications were developed and administered by the Board for Critical Care Transport Paramedic Certification (BCCTPC). The BCCTPC is a division of the International Association of
Critical Care Flight Paramedics and a member organization of the CAMTS.

The BCCTPC has partnered with Applied Measurement Professionals to ensure the examinations adhere to the National Commission for Certifying Agencies, the National Organization for Competency Assurance, and the National Council on Measurement in Education standards and are consistent with the Standards for Educational and Psychological Testing established by the American Psychological Association, the American Educational Research Association, and the National Council on Measurement in Education.

There is a significant difference between course completion (with a testing process and a certification for completing the course) and credentialing that requires the psychometric validity of an examination process developed for a certification. Using standardized certifications helps ensure the health, safety, and welfare of the patients we transport. These certifications are a reflection of who we are as professionals.

For questions about education and certifications, please reference the Education E. Frazer, R.S. Holleran / Air Medical Journal 35 (2016) 101-102
Association and Certification Matrix in the 10th Edition
Emergency Nursing Association (ENA) Board of Certification for Emergency Nursing (BCEN) Emergency Nursing Association (ENA) Board of Certification for Emergency Nursing (BCEN) Air and Surface Transport Nurses Association (ASTNA) Board of Certification for Emergency Nursing (BCEN) American Association of Critical Care Nurses (AACN) AAN Certification Cooperation National Certification Corporation Accreditation Standards. The standards are available as a free download from the camts.org Web site but to access all the addendums, like the Education and Certification Matrix, you must purchase the standards book or thumb drive also available from the CAMTS Web site.

References

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# Appendix E: Nebraska Emergency Medical Services Board

### Current as of 6/1/2018

Department of Health and Human Services Division of Public Health Licensure Unit

### Nebraska Emergency Medical Services

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<th>Name and Address</th>
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Critical Care Paramedic Credentialing Review
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<td>Secretary</td>
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Appendix F: International Board of Specialty Certification (https://www.ibscertifications.org/index):

For State Licensing Boards:

Why is accreditation important?
Accreditation is one of the key benchmarks for measuring quality. Valid accreditation is key to assuring the general public that the critical care paramedic is competent and current.

Why use the IBSC® exam process as your state's specialty certification process?
- Licensure as a paramedic is 100% the purview of State. Only specialty level certification is measured by the IBSC.
- A validated exam process that tests knowledge, not the teaching of a single program.
- No cost to the state for creating and maintaining an exam process.
- No burden to the state to create and defend a critical care exam.
- 4-year certification renewable through continuing education or retesting.

Understanding Specialty Certification
Specialty Certification is a voluntary credentialing process designed to validate essential knowledge and judgment required for safe and competent practice. Specialty Certification is not a substitute for entry-level certification and licensure, but a tool to validate additional knowledge and dovetail with existing systems. The Board for Critical Care Transport Paramedic Certification (BCCTPC) and the International Board of Specialty Certification (IBSC) developed exams to provide specialty certification designations for professionals who demonstrate knowledge, experience and excellence in a variety of specialty areas. In today's complex healthcare system, providers are engaged in specialized practice areas that require substantial additional knowledge and experience beyond what can be expected from an entry-level practitioner.

The historical evolution of paramedicine has created a situation in which specialized practice is not well defined or accepted, yet is demanded by advances in the science of medicine. Appropriate regulation of specialized practice has developed over nearly two centuries in medicine, nursing and other allied health professions. However, in EMS, multiple regulatory agencies have not been able to adopt a uniform schema nor a definition that is uniformly applied around the world. While it is clear that specialty certification processes evolve slowly, existing models provide for effective, safe and standardized specialty education programs with valid examination and ultimately improved patient outcomes. The International Board of Specialty Certification is an organized and functional specialty board that has a mission to support all specialties in specialized occupations everywhere in the world. IBSC is the only organization offering a psychometrically valid and legally defensible framework for specialty certification that answers the question of how to quantify competency in a specialty area like critical care transport or tactical medicine.

The IBSC certification process is the only one of its kind and creates a universally recognized means for medical professionals, employers and the public to understand that paramedics holding this specialty certification qualify to work in the domain of paramedicine beyond that of an entry-level paramedic.
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<td><a href="http://www.northeast.edu/">http://www.northeast.edu/</a></td>
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<td>Institution</td>
<td>Contact Name</td>
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<td>308-225-1177</td>
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