

Critical Care Transport Systems of Care in Maine
A Matrix for Maine EMS Board Consideration

Background/Introduction

In the Spring of 2023, Delta Ambulance presented a pilot project to Maine EMS which allowed the agency to transport “stable ventilated patients” using Critical Care trained Paramedics, with or without hospital personnel. This project was reviewed by a small group of Maine EMS Medical Direction and Practices Board (MDPB) members, who then presented to the MDPB as a whole. The MDPB approved the project and, recognizing that this practice has larger implications in the Maine EMS system, “the MDPB also voted at their May meeting to communicate with the Board that there is value in early discussions regarding the development of an EMS Agency and Clinician license level to encompass the activities demonstrated in the Delta Ventilated Patient Pilot Project.”¹

The Maine EMS Board discussed the MDPB’s memorandum at their June 2023 meeting and discussed the importance of early conversations regarding the Delta Pilot Project, including the creation of an “off ramp” or mechanism to endorse the practice at a larger level, as well as a structure under which Critical Care Transport (CCT) could be safely applied by other agencies. These conversations continued until the June 2024 Maine EMS Board Meeting at which point the Maine EMS Board requested that all committees of the Board and the MDPB present their thoughts and insight into CCT in the state.

This document has been reviewed by the Maine EMS Medical Direction and Practices Board (MDPB) at their July 2024 meeting and was approved by a unanimous vote of the MDPB. MDPB members’ comments have been included in this document. Topics that were brought up during MDPB discussion and individual member review are included in Appendix 1.

This document is informed by a number of different means:

- 1) Clinical practice as Emergency Physicians working in a variety of hospital venues including transferring hospitals as well as tertiary care hospitals receiving critical care patients from a variety of transporting agencies. In these cases, we have a variety of exposure to different agency make up from established CCT agencies, to agencies who staff with 911 paramedics and include a hospital nurse and/or respiratory therapist (RT) to care for the patient, to CCT’s that are accomplished by other hospital staff, including physicians, to agencies that transfer exclusively with a 911 trained paramedic and do not include any additional staff.
- 2) Clinical practice as EMS physicians in the state of Maine, which provides insight into the capabilities of the Maine EMS System, especially the services for which we currently act as or have served as medical directors,

¹ From the MDPB Memorandum to the Maine EMS Board, from State Medical Director, Dr. J. Matthew Sholl, dated May 18, 2023.

- 3) Engagement at the state system-level through the MDPB, which offers a more comprehensive understanding of the capabilities of the Maine EMS educational system, the Maine EMS quality management/improvement and performance measurement capabilities, the regulatory structure of Maine EMS, and a larger understanding of the capabilities of the Maine EMS system as a whole. This vantage also provides significant insight into current or past EMS agencies providing CCT care in Maine,
- 4) Engagement in the National Association of State EMS Officials (NASEMSO) and the NASEMSO Medical Director Council (MDC), which has allowed the state medical directors insight into how other states have approached the addition of CCT to their system, and
- 5) Exhaustive literature reviews. While the literature is not replete with guidance on standards for CCT, there do exist several references, including the Association of Critical Care Transport (ACCT) “Critical Care Transport Standards, Version 1”.² These and other references provide an understanding of the current national approach to CCT. While currently eight years old, this remains the most recent iteration of this document.

Finally, the MDPB comes to this exercise with strong foundational beliefs, namely:

- 1) Critical Care Transport is a unique EMS field that requires rigorous regulatory structure from the state, significant institutional investment from the EMS agency, and tremendous personal engagement from the individual EMS clinician.
- 2) Critically ill or injured patients are BEST managed and transported by personnel specially trained in critical care transport. Any variation from this model is not “best practice”, even if the alternate practice is the only operational option. Therefore, within the Maine EMS system, the goal scope of transport for all critically ill or injured patients is a team with specialized training, certification, license, and credentialing at the Critical Care Transport level. Any deviation from this goal should be examined by the transporting institution, with legitimate attempts to mitigate the root cause leading to an alternate transport modality.
- 3) Critical Care Transport cannot be taken piecemeal. Patients falling into the Critical Care category require a host of services that cannot be individualized, but instead must be under the rubric of an entire CCT System of Care. For instance, a ventilated patient cannot be transported by an agency or individual EMS clinician focused or trained to ONLY manage the ventilator. While ventilator management is an important skill with anchoring medical knowledge, the ventilated patient also requires sedation, astute monitoring skills, and the abilities to both predict and prevent, and always respond to, a patient’s change in status. These nuanced additional skills may not be assured under a program that focuses exclusively on one Critical Care Transport domain and therefore, CCT becomes an “all in” service line.
- 4) Lastly, the existing national, regional, and state guidance surrounding systems of well-orchestrated CCT systems establish a model for CCT programs. Varying too greatly from these models unnecessarily places patients in vulnerable situations. In establishing a CCT System of

² Available at the website: <https://nasemso.org/wp-content/uploads/ACCT-Standards-Version1-Oct2016.pdf>

Care for Maine EMS, the model should meet or exceed current national, regional, or state examples.

This document is arranged under the following seven topics, which are meant to act as starting points for the Maine EMS Board's deliberation regarding CCT in Maine:

- 1) Definitions
- 2) Agency Licensure/Requirements
- 3) EMS Clinician Licensure/Requirements (this includes education)
- 4) Medical Direction Requirements/Deliverables
- 5) Scope of Practice
- 6) Protocols
- 7) Quality Improvement/Performance Review
- 8) State Oversight and Longitudinal System Review
- 9) Appendix 1: Questions or Comments that arose during review that require consideration
- 10) Appendix 2: Other state's CCT Scopes of Practice

Definitions

Maine EMS should strive to eliminate difficulty in the determination of which scope of practice transfers any given patient. At present, the Maine EMS interfacility transport system is encumbered by complexities due to the number and nuances of the transport options (BLS, ALS, PIFT, CCT) as well as lacking the number of CCT-capable EMS Agencies needed.

Three potential solutions for these difficulties include:

- 1) Establishing pathways that allow additional services to participate in CCT in a structured, rigorous manner;
- 2) Eliminate non-essential transport modalities. For instance, with evolution in the paramedic scope of practice since the development of the PIFT scope of practice, and with increased availability of CCT agencies, the need for the PIFT scope of practice may begin to wane;
- 3) Maine EMS should strive to create a better understanding of what Critical Care Transport, a critical patient or a critical care transport team/agency are, and what these definitions mean in terms of crew configuration. We have historically struggled to define these elements of our system and relied on the proverbial "I know it when I see it" approach. The MDPB has taken steps to better define these patients and has attempted to better define "stability" in their most recent review of the PIFT scope of practice.

The ACCT “Critical Care Transport Standards, Volume 1”³ offers the following definitions:

- A Patient Requiring Critical Care Transport is defined as having “a critical illness or injury that acutely impairs one or more vital organ systems such that there is a high probability of imminent or life-threatening deterioration in the patient’s condition during transport”.
- A Critical Care Transport Team is a “team consisting of at least two clinical personnel who possess a scope of practice, education, training, experience, and requisite decision-making skills to assess and support a highly complex patient [with] active or potential vital organ system failure and/or to, at a minimum, prevent further life-threatening deterioration of the patient’s condition during transport”.
- A Critical Care Transport Agency is an agency having “essential systems and oversight in place to meet the needs of critical care patients evidenced by licensing, credentialing, and physician oversight. The agency must be licensed and/or credentialed” and the agency must have “physician medical oversight consistent with the acuity and conditions of the critical care patients transported”.

The MDPB has attempted to better define the category of patient that should engender an established CCT team by focusing on the patient’s “stability” or lack thereof and defines “unstable” patients and patients with high risk of deterioration as those best managed by CCT teams. “Unstable” is defined in the most recent versions of the PIFT standards as “any patient requiring intervention to respond to and/or stabilize mental status or vital signs within two (2) hours (120 minutes) prior to request for transfer. All patients who are in the early process of evaluation or stabilization within a hospital facility requiring transfer should be considered “unstable or undifferentiated” until proven otherwise. Examples include, but are not limited to, the following: status asthmaticus, COPD exacerbation requiring nebulizer treatment, non-invasive positive pressure ventilation, G.I. bleeds with evidence of hemorrhagic shock, acute coronary syndrome with associated cardiogenic shock or pulmonary edema, trauma patient requiring resuscitation with crystalloid or colloid therapy to address vitals sign abnormalities, acutely intubated patient requiring ventilator management, and those patients suffering from acute toxidromes requiring emergent antidote therapy.” In addition, “high risk of deterioration” is defined as a “patient whose condition has been initially stabilized, but has likelihood of deterioration, based upon the assessment or knowledge of the sending provider regarding specific illness/injury.”

These are provided as examples. Regardless of the final definitions, it will be essential moving forward to have well-established definitions of each of the above elements (e.g., patients, teams, and agencies). While there will always be nuances to these patients, clarity of definitions along with simplicity and increased access to resources will begin to diminish the potential pitfalls and vulnerabilities of pairing a high resource-requiring-patient with a team/provider or agency that is not established to provide those resources.

³ Association of Critical Care Transport, “Critical Care Transport Standards, Volume 1”, 2016, page 4, available at the website <https://nasmso.org/wp-content/uploads/ACCT-Standards-Version1-Oct2016.pdf>

Agency Licensure/Requirements

Licensure, at the agency and clinician level, is essential for the success of any system of care. Systems of care thrive in circumstances under which there is a transparent understanding of underlying requirements and obligations, where there is a commitment to meet those requirements and obligations, and where there is ongoing review of the system's performance resulting in updates and amendments when deemed operationally or clinically necessary. Maine EMS's mechanism to establish standards and encourage rigor is through the creation of requirements that all interested agencies or clinicians are obliged to meet. Because requirements are different at the agency and individual level, it is essential to have both agency licensure as well as individual licensure. Regulation in its truest form is the state's attempts to establish common standards for all patients encountered throughout its geography and create systems that uniformly offer standard and excellent care. The means by which Maine EMS regulates other elements of the system are to create rigorous, but fair, transparent and clinically reasonable license levels at the agency and clinician level.

At the agency level, the licensure process should establish that the agency is committed to the rigor required to provide this scope of practice. This could include:

- 1) Ensuring that CCT will be conducted by a team of at least two trained clinical personnel that possess the scope of practice, training, education, and comprehensive agency support necessary to safely and effectively manage critical care patients (OF NOTE: The exact make-up of these clinical personnel should be determined in a collaborative fashion, but Maine EMS should be thoughtful of current local and regional models including a CCT-trained paramedic and a CCT-trained nurse as well as common national guidance and, should Maine EMS offer a variance from this practice, it should only be after considerable deliberation with detailed rationale),
- 2) Demonstrate a commitment to physician oversight by employing and supporting physicians to provide the appropriate level of on-line and off-line system support (see section on Medical Direction Requirements and Deliverables),
- 3) Establish a continuing education model that not only maintains EMS clinician proficiency, but also supports the EMS clinician's clinical growth, while allowing for identification of lapses in clinician capabilities and then providing strong remediation processes to allow for reestablishment of capabilities,
- 4) Demonstrates a significant tether to the larger hospital system that promotes communication, education, patient follow-up, and quality initiatives, and
- 5) Signifies a commitment and prowess with quality improvement (QI) and performance review with significant resources to ensure all CCT EMS clinicians are supported by the QI programming.

In addition to the above, it should be the goal of CCT EMS Agencies to become verified by nationally recognized EMS accreditation bodies, such as the Association of Critical Care Transport (ACCT) or the Commission on Accreditation of Medical Transport Systems (CAMTS). Maine EMS should have collaborative discussions regarding the merit of making such accreditation required for initiation of the EMS Agency's CCT program, or to make this a requirement after initiation of the program as an element

of re-licensure. The addition of such an accreditation process offers a nationally recognized mechanism that provides an outside perspective and ensures that EMS Agencies interested in CCT have invested an appropriate level of resources to reasonably support critical care transport and can achieve and maintain a standard of care equivalent to other agencies performing a similar scope of practice. Such an accreditation process is outside of the current practice of Maine EMS and to duplicate such a process would likely NOT be fiscally responsible or approachable and would not provide the perspective available through nationally recognized bodies.

EMS Clinician Licensure/Requirements (this includes education)

Equally important is the establishment of licensure of individual EMS clinicians interested in practicing as CCT EMS Clinicians. While outside of the scope of this document, Maine EMS should also consider how to embrace nurses practicing as CCT nurses in the EMS environment.

EMS clinicians licensed as CCT paramedics should have completed an approved CCT training program provided through a Maine EMS-approved training center, or Maine EMS approved training program, and must have passed a nationally recognized certifying exam, such as the International Board of Specialty Certification (IBSC) examinations⁴. After licensing, CCT EMS Clinicians must be credentialed by their CCT agency medical director, and successful credentialing must be provided when re-licensing.

The state should also consider adopting a re-licensure process, which may be suggested by the initial credentialing body, depending on what credentialing process is adopted by the state.

Medical Direction Requirements/Deliverables

Medical direction of a CCT Agency is complex and should ONLY be undertaken by physicians with significant insight into the EMS System. CCT medical directors should have demonstrated abilities, either through their established practice or, more enviable, through established training such as EMS Board Certification. Medical direction of a CCT program is complex and requires significant resources such that many CCT agencies employ a team of medical directors or a single medical director with multiple consultant specialists. These physicians must be licensed and actively practicing in Maine in a field that routinely manages critical patients to ensure they are proximate to the service, are able to create strong relationships with the service's leadership and clinicians, and possess the clinical skills and expertise required of an individual overseeing a CCT practice. While it is difficult to comprehensively define the amount of time appropriated for the physician to carry out duties as a CCT medical director, it should be enough to allow the physician to comfortably provide, at minimum, the following deliverables:

⁴ IBSC CCT-EMTP Information available at the following website:

<https://www.ibscertifications.org/roles/critical-care-paramedic#gsc.tab=0>

- 1) Develop, oversee, evolve when necessary, and in some cases lead administrative support programs such as the quality improvement/performance review program, the continuing education system, and the credentialing process,
- 2) Establish and maintain a comprehensive on-line consulting service that offers EMS clinicians ubiquitous live-time consulting capabilities for patient selection or patient care questions,
- 3) Establish and maintain relationships with sending and receiving hospitals, as well as the clinical leaders from both facilities,
- 4) Create and operate a credentialing system that ensures all transferring CCT EMS clinicians are capable of and comfortable performing all skills within the clinician's defined scope of practice. This includes not only the performance of the skill itself, but any medical decision making leading up to the skill and management of any foreseeable complications from the procedure.

In general, this could approximate at least 0.25 to 0.50 or more full time equivalents (higher for higher volume services), and the EMS agency should have a means to support the CCT medical director to account for this level of engagement. Please note, this level of support is exclusively for the administrative tasks required of the Medical Director and does not account for the time required to provide comprehensive on call consultative coverage.

Scope of Practice

A clearly established scope of practice for CCT EMS Clinicians is essential for transparency and appropriate transport provider selection. As with other scopes of practice in Maine, this falls under the authority of the Maine EMS Board. The MDPB is open and willing to support this effort. It is beyond the scope of this document to define the exact scope of practice for Maine EMS CCT EMS Clinicians and any final CCT EMS Clinician scope of practice should be adjudicated through a collaborative approach. For examples of different states' approaches to CCT EMS Clinician scope of practice, please see Appendix 2.

One important point: as with other scopes of practice in Maine EMS, even with established state-based scopes of practice, there may be variability between agencies offering CCT services. For instance, historically, finger stick glucometry testing has been in the scope of the EMT, however, in the past, not all EMS Agencies licensed at the EMT scope had glucometers available or had trained EMTs to perform the test. Similarly, extracorporeal membrane oxygenation (ECMO) may be in the scope of practice for CCT EMS clinicians/agencies, but not all CCT clinicians/agencies may be trained/equipped or capable of certain very specialized transfers. These practices may be approached similarly to the approach to glucometry in the past, using language such as "if available and so trained".

Protocols

Maine has a long history of statewide protocols for 911 services. Statewide 911 protocols have been highlighted as a valuable tool for the rapid propagation of best practices over a state's geography.⁵ When properly reviewed and maintained, statewide protocols have tremendous value by standardizing most contemporaneous care over an entire body of licensees and patients, ensuring all patients in a geography are provided standard care. Similarly, Maine EMS should consider the value of creating standardized state-wide CCT protocols for the management of CCT patients. While the referring physician is responsible for the patient being transferred from one facility to another,⁶ not all referring physicians have either the bandwidth or the expertise in Transport Medicine, including Critical Care Transport Medicine, to adequately account for all of the patient's needs during transfer. Maine EMS should consider the value of statewide protocols for the CCT systems and, if determined statewide protocols should be adopted, create pathways to account for potential variance in agency/clinician capabilities (e.g. the ECMO discussion above) and create mechanisms to ensure the protocols are maintained and capable of rapid adoption based on clinical needs.

Quality Improvement/Performance Review

Quality improvement and performance review systems are essential for all EMS agencies and equally essential in the oversight of a critical care system of care. Ultimately, if protocols are the attempt to ensure excellent care in every patient encounter, the QI processes are the commitment to that goal and should continually ask; "Did we meet our expectations with this patient encounter?". Every CCT patient encounter must be reviewed by the EMS agency's CCT medical director to ensure excellent care. In addition, the EMS agency should adopt a means of performance review that allows for bench marking against national standards and similar services.

The EMS agency interested in offering CCT should have demonstrated a significant investment in their QI system by employing dedicated individuals who are trained in performing QI and measuring the agency's and its clinicians' performance. All of these activities must be established, organized, managed, and overseen by the service's medical director(s) and must be both meticulous and timely enough to discover issues in a reasonable amount of time.

State Oversight and Longitudinal System Review

In addition to the above activities and QI at the service level, there should be additional efforts at the state level to continually assess the performance of the state's CCT system. Ultimately, under perfect circumstances, there would be a Maine EMS Staff member with dedicated responsibilities over the CCT system to ensure adequate training, quality improvement/performance measurement activities, and

⁵ NASEMSO "Statewide Implementation of a Prehospital Care Guideline". 2016, from the website: https://nasemso.org/wp-content/uploads/EBG_NHTSA_FinalReport.pdf

⁶ National Highway Traffic Safety Administration "Guide for Interfacility Patient Transfer", 2006, page 12, from the website: https://www.ems.gov/assets/Interfacility_Transfers.pdf

clinical care. Even without such a staff position, there could be considerable value in reporting performance metrics from CCT EMS Agencies to the state to ensure transparency and Maine EMS's understanding of the system's performance.

The state should also entertain creating mechanisms to allow ongoing protocol review and maintenance, similar to the process the MDPB performs for the 911 system. Even though the MDPB may be essential in the review and approval of such protocols, the group as a whole likely does not have the bandwidth to be the primary actor on such a project, and the state should consider an alternate group to manage these activities. One potential model is the creation of a CCT Committee under the Maine EMS Board, similar to the Community Paramedicine Committee. This group could have the following, amongst other, deliverables:

- 1) Advise the Maine EMS Board on issues pertinent to the CCT System of Care, particularly surrounding rules and regulations.
- 2) Comprehensively prepare updates to CCT Protocols for MDPB review and approval.
- 3) Set expectations and standards surrounding uniform CCT performance metrics.
- 4) Compile statewide, deidentified performance metrics for the Maine EMS Board and MDPB review on a routine basis.
- 5) Act as subject matter experts and support the Maine EMS CCT System of Care by discussing national, regional or statewide best practices in CCT, continuing educational topics, etc.

The MDPB is excited to participate in this conversation and support future steps toward the vision of a rigorous, quality, and accessible CCT System of Care. This document is one step toward that goal. While the MDPB understands that there are additional elements within these topics which will require consideration and there are additional topics beyond these that will arise throughout the conversation, the MDPB's hopes are that this document starts a larger conversation surrounding the development of a CCT System of Care in Maine.

Appendix 1 - Questions for Consideration that Arose During the Review Process:

- 1) Is there value in requiring CCT Agencies to have high levels connectivity with hospitals?
 - a) For instance, a “sponsoring” hospital that is able to support the Agency in their ongoing needs (i.e., education, clinical support, consultive services, patient follow-up, etc.)?
 - b) If YES, Does the nature of that facility matter (i.e., should it be a receiving facility OR can any hospital be a sponsoring agency)?
- 2) How does this program embrace nurses? Is there even a need to consider that? Would a partnership with the Board of Nursing help?
- 3) Do existing Training Centers have the capacity/experience to support this level of training?
 - a) How does Maine EMS ensure that interested Training Centers have educators qualified to teach these courses?
 - b) Does the requirement for passing a certifying exam suffice?
 - c) Should faculty and their qualifications be considered in the course approval process?
- 4) As the need for PIFT wanes, and the number of CCT capable agencies increases, will need to ensure that no gaps exist between the current system and the future system of transport.
- 5) While we cannot oversee or regulate physician practice, should we track the instances when physicians are staffing CCT transports?
 - a) If for nothing else, to gain awareness and understand CCT transfer need, then maybe work with facilities that are repeatedly performing this to determine if other resources could help?
- 6) How do we promote the high level of medical direction that these services require?
 - a) Historically, it has been difficult to either recruit or support medical directors. These services require high levels of medical direction from highly capable medical directors. This should not be a voluntary effort. The document mentions it is “difficult to comprehensively define the amount of time appropriated for the physician to carry out duties as a CCT medical director” – in reality, these are commonly 0.5 – 1.0 FTE’s worth of time and legitimate CCT transport systems employ enough physician support to provide ubiquitous call coverage. We will need to work with interested services to ensure an appropriate level of physician engagement.
- 7) As part of the EMS Clinician licensing discussion, medical director credentialling should be discussed, in particular, what skills or decision-making should go through a credentialling process and what is the time period between credentialling?
 - a) Some skills may be reasonable to credentialling annually (e.g., skills that are commonly used in clinical practice of the CCT clinician) while others are high-risk and/or low-frequency and should be credentialled more commonly.
- 8) The MDPB would like to add to the list a consideration of the possibilities and limitations of credentialling.
- 9) Some have questioned if the Medical Director needs to be licensed and practicing in Maine. While there is room to discuss, the Medical Director of Maine EMS feels that these positions are so vital to the organization, that in a service that is primarily Maine-based and performing the vast majority of their activities inside the state’s boundaries, that YES, the Medical Director should be licensed and practicing in Maine. There may be services whose primary footprint is somewhere else, but may

occasionally come to Maine (DHART, Boston Med Flight come to mind) and in these cases, because their primary footprint is elsewhere, it may not be necessary or even feasible to require those services to have a Maine licensed or practicing physician. For services primarily practicing in Maine, an in state Medical Director is essential for many reasons, proximity to the workforce, ability to create and maintain relationships (with the EMS clinicians working for the service and with other health care leadership or physician colleagues in the state), to facilitate in person education when necessary (esp. surrounding skills or credentialling), etc.

- 10) Some have asked, when discussing on-line medical consultation, isn't the sending physician the "real" OLMC?
- a) In many settings, the sending physician is perfectly positioned to perform on-line medical consultation for transferred patients. In these settings, the sending physician is the most recent physician to care for the patient and arguably knows more about the current state of the patient than any other physician and is therefore best suited to provide consultation when interfacility questions arise. In Critical Care Transports, the system's complexities and the system's nuances, plus the critical care needs of the patient commonly create circumstances in which dedicated, service specific Medical Directors are the best options for on line medical consultation. These service specific Medical Directors are familiar and comfortable with the individual EMS Clinicians, their competency, their credentialling, their education and the protocols that guide clinical care. It is not feasible to expect that a sending physician would have this level of nuanced knowledge, and therefore, OLMC for CCT's originates from the service's Medical Director(s) in the vast majority of cases.

Appendix 2 – Examples of Other States’ CCT EMS Clinician Scope of Practice

Mississippi Critical Care Paramedic Scope of Practice

From the website: <https://msdh.ms.gov/page/resources/8155.pdf>, page 151 - 152

- Initiate and manage ventilators;
- Insert and/or manage surgical cricothyrotomy;
- Initiate (with direct verbal order from medical control) and manage chest tubes;
- Provide care for cardiac patients with, but not limited to, cardiac interventions and advanced therapeutic devices;
- Initiate (with direct verbal order from medical control), access, monitor and manage arterial lines, to include any necessary anchoring techniques;
- Access, monitor and manage central and arterial lines, to include hemodynamic monitoring;
- Rapid Sequence Induction;
- Initiate blood and blood products;
- Interpret laboratory results of blood and urine specimens;
- Initiate/administer, maintain and manage medications (excluding chemotherapeutic agents) required for the care of the critical care patient;
- Initiate and manage urinary draining devices;
- Perform escharotomy/fasciotomy (with direct verbal order from medical control);
- Monitor and manage intracranial monitoring devices/drainage devices.

Arizona Critical Care Scope of Practice – In draft Rule form, shared with Dr. Matthew Sholl by the AZ State Medical Director, Dr. Gail Bradley

- Transport ventilators with advanced modes
- Chest tube placement and management
- Finger thoracostomy
- RSI
- Hemodynamic monitoring – invasive (central and arterial)
- ICP monitoring
- Circulatory augmentation device monitoring and management (intra-arterial balloon pump, Impella, etc.)
- Ventricular Assist Device (VAD) – monitoring and management
- Initiation and maintenance of blood product transfusion
- Arterial blood sampling

- Point of care and laboratory sampling and interpretation
- External fetal monitoring
- Neonatal isolette monitoring
- Ultrasound

Iowa Critical Care Scope of Practice – of note, the below are in addition to the Iowa standard Paramedic Scope of Practice.

- Cricothyrotomy – surgical
- Blood sampling arterial
- Circulatory augmentation device monitoring
- Hemodynamic monitoring – central/arterial
- ICP monitoring
- Monitoring – arterial line

Utah Critical Care Scope of Practice

UT defines the requirements for annual competencies.

8.1 Completion of annual Critical Care Paramedic policy and skills competency, education, and evaluation may include the following such as:

- Chest tube management
- Ventilator management
- Invasive monitoring
- Drip calculation and management
- Advanced pharmacology