SENTINEL SKILLS
SYSTEMS, INC.

Sentinel White Paper Series

Volume 1

White Paper No. 2

Building a Continuous Competency System for EMS

An Implementation Framework for Sustaining High-Acuity, Low-Frequency Clinical Skills

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Executive Summary

Emergency Medical Services (EMS) clinicians are expected to perform complex, high-risk procedures under conditions of urgency, uncertainty, and cognitive overload. Yet many of these procedures occur too infrequently in routine practice to sustain proficiency through clinical experience alone. Traditional competency models, commonly based on initial education, annual skills verification, and periodic continuing education, may confirm performance at a single point in time but cannot reliably preserve technical skill, clinical judgment, or decision-making readiness between evaluations. For high-acuity, low-frequency procedures, competency must be continuously reinforced rather than periodically assumed.

The challenge is not simply a lack of training. Many EMS agencies already conduct simulation, review clinical cases, monitor performance, and provide continuing education. However, these activities often operate independently, without a common set of competency standards or a process for translating performance findings into targeted development. Training may not reflect patterns identified through quality assurance. Clinical experiences may not be documented or incorporated into individual competency plans. Performance data may be collected without producing timely feedback. When these activities remain disconnected, agencies can expend considerable time and resources without creating a reliable system for sustaining readiness.

A continuous competency system deliberately integrates leadership, training, clinical exposure, feedback, performance measurement, and quality improvement into an ongoing organizational process. Leadership establishes expectations, assigns accountability, protects time for participation, and creates a culture in which learning and improvement are supported. Brief,

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frequent simulation reinforces procedural technique and allows clinicians to practice decision-making under realistic operational conditions. Clinical partnerships provide access to supervised patient care and other experiences that simulation cannot fully reproduce. Structured case review and coaching convert field performance into timely learning, while competency tracking enables agencies to identify declining exposure, emerging performance gaps, and opportunities for targeted support.

Performance measurement is essential to this system, but measurement should extend beyond whether a procedure was completed successfully. Agencies should also consider frequency and recency of exposure, first-pass success, complications, decision quality, adherence to clinical standards, simulation performance, participation in clinical rotations, and response to remediation. These measures allow leaders to evaluate not only individual performance but also whether organizational policies, equipment, training, supervision, and clinical partnerships adequately support reliable care. Data should be used primarily to guide learning and system improvement, not to create a punitive environment that discourages transparency.

Implementation does not require an immediate, organization-wide transformation. A phased approach allows an agency to assess its current capabilities, define measurable standards, select a priority procedure, and test the system with a manageable group of clinicians, stations, or shifts. Findings from the pilot can then be used to refine workflows, address staffing and resource constraints, strengthen partnerships, and establish evidence for broader implementation. This approach reduces operational disruption and allows the competency system to develop in response to the agency's actual needs and capacity.

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Although airway management provides a useful example, the framework can be applied to other high-acuity, low-frequency procedures, including intraosseous access, chest decompression, cricothyrotomy, complicated childbirth, pediatric resuscitation, and management of specialized infusions. The underlying principle remains the same: EMS organizations cannot control how frequently clinicians encounter rare and critical events, but they can control how deliberately readiness is maintained between them.

“Readiness is built between emergencies”

Continuous competency is therefore not simply more training. It is the coordinated integration of activities that many EMS organizations already perform separately. By connecting practice, clinical exposure, feedback, measurement, quality improvement, and leadership support, EMS agencies can move beyond episodic verification and build an organizational system designed to sustain clinical readiness over time.

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Introduction

Building upon the findings presented in White Paper No. 1, this second publication in the Sentinel White Paper Series presents an implementation framework for sustaining competency in high acuity, low frequency clinical skills. It demonstrated that inconsistent airway performance is not simply an individual training problem. It is a system-level challenge shaped by how EMS organizations structure clinical education, quality assurance, leadership accountability, and opportunities for continued development (von Vopelius-Feldt et al., 2023).

This second white paper moves from diagnosis to solution. It presents an implementation framework for building a continuous competency system that supports clinicians throughout their professional practice. The objective is not to replace initial education, certification, continuing education, or periodic skills verification. Each serves an important purpose. However, these mechanisms primarily establish entry-level qualifications or document performance at a specific point in time. They do not guarantee that clinicians will remain prepared to perform complex procedures months or years later, particularly when opportunities for real-world use are limited (Legoux et al., 2020; Weber et al., 2024).

Sustained readiness requires an organizational infrastructure that operates between formal training events. Such an infrastructure must connect leadership expectations, frequent simulation, meaningful clinical exposure, case review, timely feedback, performance measurement, and continuous quality improvement (Bienstock et al., 2022; Vithalani et al., 2022). When these functions are treated as isolated activities, competency gaps can remain undetected until a critical patient encounter exposes them. When deliberately integrated, they create an ongoing cycle

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through which performance is practiced, observed, evaluated, reinforced, and improved (von Vopelius-Feldt et al., 2023).

Airway management provides the primary example throughout this paper because it illustrates the challenge clearly. Endotracheal intubation requires technical ability, clinical judgment, equipment familiarity, team coordination, and effective decision-making under pressure, yet many paramedics perform the procedure infrequently (Thomas et al., 2024; Zaphir et al., 2024). The proposed framework, however, is not limited to airway care. It can be adapted to other high-acuity, low-frequency procedures, including intraosseous access, chest decompression, cricothyrotomy, complicated childbirth, pediatric resuscitation, and management of specialized infusions (Weber et al., 2024). This framework is vendor-neutral and can be implemented using an agency's existing equipment, simulation resources, educational programs, and quality improvement processes.

The central premise of this paper is straightforward: competency cannot be sustained through episodic training alone. EMS organizations must create systems that maintain readiness continuously, identify emerging gaps before they affect patient care, and provide clinicians with the practice, experience, feedback, and organizational support necessary to perform reliably when rare but critical emergencies occur (Bienstock et al., 2022; Legoux et al., 2020; Vithalani et al., 2022).

From Episodic Training to Continuous Competency

Traditional EMS education has largely been organized around events. Clinicians complete an initial education program, demonstrate required skills, obtain certification, attend periodic

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continuing education, and participate in annual or semiannual competency verification. These activities establish important professional standards and provide agencies with a structured method for documenting compliance. However, event-based training captures performance only at isolated moments. It cannot demonstrate whether a clinician will retain the same technical ability, clinical judgment, and decision-making capacity throughout the months between evaluations (Legoux et al., 2020; Weber et al., 2024).

This limitation is especially consequential for high-acuity, low-frequency procedures. A paramedic may successfully complete an airway skills station during annual verification but then encounter few, if any, opportunities to perform endotracheal intubation before the next evaluation. During that interval, procedural sequencing may become less automatic, equipment familiarity may decline, and decision-making may slow. The clinician may remain certified and technically authorized to perform the procedure while becoming progressively less prepared to execute it under difficult field conditions (Thomas et al., 2024; Wang et al., 2024).

Event-based models can also create a misleading sense of security. A completed training record confirms that an activity occurred, but it does not necessarily establish that learning was retained, transferred to clinical practice, or maintained over time. Similarly, successful performance in a controlled classroom environment may not predict performance in a confined space, during a chaotic resuscitation, or while managing a deteriorating patient with limited assistance. The problem is not that periodic verification has no value. The problem is that it is often asked to accomplish more than it can reasonably deliver (Bienstock et al., 2022; Legoux et al., 2020).

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Certification, Competence, Proficiency, and Readiness

A continuous competency system begins by distinguishing four related but different concepts: certification, competence, proficiency, and readiness.

Certification establishes that a clinician has satisfied defined educational, examination, and regulatory requirements. It provides authorization to practice within an approved scope, but it does not guarantee continued mastery of every procedure included within that scope.

Competence refers to the ability to perform a procedure or clinical responsibility according to an established standard. Competence may be demonstrated through examination, simulation, direct observation, or clinical performance. Like certification, however, a competency determination often reflects performance at a particular point in time.

Proficiency represents a higher and more consistent level of performance developed through repetition, experience, feedback, and refinement. A proficient clinician does more than complete the required procedural steps. The clinician recognizes changing conditions, anticipates complications, adapts technique, and performs efficiently under pressure.

Readiness is the capacity to apply competence and proficiency when the procedure is actually needed. It includes technical skill, clinical judgment, equipment familiarity, psychological preparedness, team coordination, and the ability to manage cognitive load. A clinician may be certified and may previously have demonstrated competence, yet still lack full operational readiness if the skill has not been practiced or performed for an extended period (Paas & van Merriënboer, 2020; Zaphir et al., 2024).

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These distinctions matter because EMS agencies often use certification or annual verification as a substitute for readiness. Certification answers whether a clinician is qualified and authorized to perform a procedure. Competency assessment answers whether the clinician can demonstrate the procedure under defined conditions. Readiness asks the more difficult operational question: Is the clinician prepared to perform safely and effectively today, under the conditions likely to be encountered in the field?

Competency Must Be Maintained

Competency in complex procedures is not permanent. It changes in response to practice frequency, clinical exposure, feedback, equipment familiarity, physical and cognitive demands, and the time elapsed since the procedure was last performed. Skills that are not regularly used become slower, less consistent, and more vulnerable to error. This process may occur even among experienced clinicians who were highly capable earlier in their careers (Legoux et al., 2020; McKenna & Glendon, 1985).

For that reason, competency should be understood as a dynamic condition rather than a qualification achieved once and retained indefinitely. Periodic reverification may detect a gap after it has developed, but continuous maintenance is intended to reduce the likelihood that the gap develops in the first place. This requires repeated contact with the skill through deliberate practice, realistic simulation, clinical exposure, case review, and timely performance feedback (Bienstock et al., 2022; Wayne et al., 2006).

The objective is not to test clinicians continuously. Excessive testing can create administrative burden, encourage superficial compliance, and undermine the learning culture necessary for

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improvement. Instead, the goal is to create regular opportunities for clinicians to practice, receive feedback, identify limitations, and strengthen performance before the skill is required during an emergency.

Declining Clinical Exposure and the Limits of Traditional Models

Traditional competency models were more sustainable when clinicians regularly reinforced their skills through routine patient care. Repeated clinical exposure allowed procedural technique and decision-making to develop naturally over time. In many EMS systems, that assumption is no longer valid.

Changes in airway protocols, increased use of supraglottic airways, greater emphasis on noninvasive management, variations in call volume, workforce distribution, and the number of credentialed paramedics available for each critical patient have reduced individual exposure to endotracheal intubation. Similar exposure challenges affect other high-acuity procedures. A clinician may complete all required education while having very few opportunities to translate that education into repeated clinical performance (Levi et al., 2024; Thomas et al., 2024; Wang et al., 2024).

As exposure declines, the interval between real procedures grows longer. Simulation becomes more important, but occasional simulation cannot fully reproduce the complexity, variability, and consequences of actual patient care. Annual verification becomes increasingly inadequate because it evaluates a clinician after months of limited exposure without providing the continuous reinforcement needed during that interval. The less frequently a procedure occurs in

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practice, the more deliberately the organization must create alternative opportunities to sustain readiness (Bienstock et al., 2022; Trimmel et al., 2017).

This creates a fundamental shift in responsibility. EMS agencies can no longer assume that clinical experience will provide sufficient repetition or that individual clinicians can independently compensate for declining exposure. Individual clinicians should remain accountable for professional development, but they do not control call distribution, staffing patterns, training schedules, access to simulation equipment, hospital partnerships, quality assurance systems, or the availability of performance data. These conditions are established organizationally.

Competency as an Organizational Capability

A continuous competency system recognizes that reliable clinical performance emerges from the interaction between the clinician and the organization. Individual preparation remains essential, but readiness is also influenced by leadership priorities, training design, equipment standardization, medical oversight, access to clinical experience, feedback processes, staffing, and organizational culture (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

Competency therefore must be treated as an organizational capability. An EMS organization demonstrates this capability when it can consistently prepare clinicians for rare but critical events, recognize declining exposure or performance, provide targeted support, and adapt its training and clinical systems in response to evidence. This requires coordination across leadership, education, operations, quality improvement, and medical direction (Rotteau et al., 2022; Weick & Sutcliffe, 2015).

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“Competency is not a training event. It is an organizational system."

Such an approach changes the questions leaders ask. Instead of asking only whether personnel completed annual training, leaders examine whether clinicians receive sufficient opportunities to practice, whether training reflects field conditions, whether performance data generate useful feedback, whether clinical partnerships expand meaningful exposure, and whether identified gaps lead to measurable improvement. Responsibility shifts from documenting activity to sustaining performance.

The core principle of continuous competency is therefore clear:

Competency is not a training event. It is an organizational system that must operate continuously.

Adopting this principle does not require EMS organizations to abandon certification, continuing education, or periodic verification. It requires placing those activities within a larger system that connects practice, clinical experience, feedback, measurement, and leadership support. When those elements operate together, competency becomes more than a record of past performance. It becomes a continuously maintained state of readiness (Vithalani et al., 2022; Weber et al., 2024).

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The Continuous Competency System

A continuous competency system is an integrated organizational structure for maintaining clinical readiness throughout a clinician's career. It connects leadership, competency standards, simulation, clinical exposure, feedback, performance measurement, and quality improvement so that each activity informs and reinforces the others (see Figure 1). The system is continuous because it does not wait for an annual evaluation, an adverse event, or an identified performance failure before acting. It creates recurring opportunities to practice, observe, measure, and improve performance (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

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Figure 1. The Continuous Competency System

Many EMS agencies already conduct some of these activities. They may offer simulation exercises, review selected cases, track procedural success, or arrange occasional hospital rotations. The weakness is often not the complete absence of these activities but the lack of coordination among them. Training officers may not receive timely information from quality improvement personnel. Supervisors may not know which clinicians have experienced prolonged gaps in procedural exposure. Medical directors may review complications without having access to simulation or competency records. Leaders may approve annual training without evaluating whether it addresses the organization's actual performance needs.

A continuous competency system brings these functions together. It establishes defined standards, assigns responsibility, tracks exposure and performance, and uses findings to guide future training and organizational decisions. Its seven components are interconnected and mutually dependent. No single component can sustain readiness by itself.

1. Leadership Commitment and Governance

Continuous competency begins with leadership. Without visible executive support, competency initiatives are easily displaced by staffing shortages, response demands, scheduling conflicts, budget pressures, and competing organizational priorities. Leaders establish whether competency maintenance is treated as an essential operational responsibility or as an educational activity conducted only when circumstances permit (Murray et al., 2024; Rotteau et al., 2022; Weick & Sutcliffe, 2015).

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The EMS chief or executive leader should establish clinical readiness as an organizational priority and ensure that it is reflected in strategic plans, policies, budgets, staffing decisions, and performance expectations. This does not require the chief to manage every training exercise or case review. It requires executive ownership of the system and clear accountability for its operation.

Governance should define the responsibilities of each participating role. Although responsibilities will vary according to agency size and structure, the following general division is appropriate:

- The **EMS chief or executive leader** establishes priorities, authorizes resources, removes organizational barriers, and holds responsible personnel accountable for implementation.
- The **medical director** defines clinical expectations, approves competency standards, reviews significant clinical findings, and provides medical oversight for remediation and performance improvement.
- The **training officer or clinical educator** designs practice activities, manages competency assessments, coordinates clinical experiences, and translates performance findings into educational interventions.
- **Field supervisors** protect participation at the operational level, reinforce performance expectations, identify barriers, and support practice and debriefing during routine operations.
- **Quality improvement personnel** collect and analyze clinical data, coordinate case review, identify patterns, and communicate actionable findings to educators, medical directors, and leadership.
- **Individual clinicians** participate in training and review, maintain professional accountability, seek feedback, report concerns, and engage honestly in improvement activities.

In smaller organizations, one person may perform several of these functions. That does not eliminate the need to define them. Responsibilities should be assigned explicitly so that essential activities do not depend on informal assumptions or individual initiative.

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Leadership must also protect time for participation. A competency program cannot operate reliably if training is repeatedly cancelled, shortened, or deferred because of operational demands. EMS will always face unpredictable workload, but leaders can establish reasonable expectations for protected training time, schedule alternative opportunities, authorize backfill when necessary, and incorporate brief practice into routine station activities. Protecting training time signals that competency is part of operations rather than separate from them.

Adequate staffing and resources are equally important. Agencies should determine what personnel, equipment, instructional capacity, data support, and clinical partnerships are required before implementation. A continuous system does not necessarily require an immediate major investment. It does, however, require leaders to recognize that readiness has a cost and to plan for it deliberately. Unfunded expectations eventually become inconsistent practices.

Policies should establish performance expectations, review procedures, documentation requirements, confidentiality protections, and pathways for coaching or remediation. These policies should be clear enough to promote consistency while retaining flexibility for clinical judgment and individual development.

Finally, leaders must create psychological safety. Clinicians should be able to discuss difficult cases, disclose uncertainty, acknowledge mistakes, and request additional practice without automatically fearing punishment or professional humiliation. A nonpunitive learning culture does not eliminate accountability. Reckless behavior, dishonesty, repeated refusal to follow established standards, or serious misconduct may require formal action. Most performance gaps, however, should first be approached as opportunities to understand what happened, identify

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contributing conditions, and improve both the clinician and the system (Meadley et al., 2023; Murray et al., 2024).

2. Competency Standards and Baseline Assessment

An organization cannot maintain competency until it defines what competent performance means. General expectations such as “maintain airway proficiency” are too vague to guide training, evaluation, or improvement. Standards must describe the knowledge, technical behaviors, clinical decisions, communication practices, and safety measures expected during performance (Vithalani et al., 2022; Weber et al., 2024).

For airway management, standards may include patient assessment, recognition of indications and contraindications, preoxygenation, positioning, equipment preparation, medication selection, procedural technique, confirmation of tube placement, ventilatory management, recognition of complications, and transition to an alternative airway plan. Team leadership and communication should also be included because successful airway management depends on coordinated performance rather than procedural technique alone.

Standards should be clinically appropriate, consistent with the agency’s scope of practice and protocols, and approved by the medical director. They should also reflect the conditions clinicians are likely to encounter. A standard limited to successful tube placement on a stationary mannequin does not fully represent competent field performance. Operational competency includes selecting the appropriate intervention, preparing the team, managing complications, recognizing failure, and changing strategies when necessary.

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Once standards are established, the organization should conduct a baseline assessment. This assessment should examine both individual performance and the system that supports it.

At the individual level, the agency may evaluate:

- Knowledge of clinical indications and protocols.
- Technical performance during simulation.
- Clinical reasoning and device selection.
- Familiarity with equipment.
- Frequency and recency of procedural exposure.
- Previous field performance.
- Participation in continuing education and clinical rotations.
- Confidence and self-identified learning needs.

At the organizational level, the agency should examine:

- Current training frequency and quality.
- Availability and condition of simulation equipment.
- Consistency of equipment across response units.
- Access to clinical experiences.
- Case-review practices.
- Quality and completeness of performance data.
- Availability of timely feedback.
- Staffing and scheduling capacity.
- Medical director participation.
- Leadership support and accountability.
- Organizational attitudes toward reporting, feedback, and remediation.

This distinction is important because an apparent individual deficiency may reflect a system-level problem. A clinician who performs poorly during equipment preparation may need

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additional practice, but inconsistent airway bag layouts across units may also contribute. A provider who has not performed an intubation in two years may require targeted development, but the larger issue may be how clinical opportunities are distributed or whether the agency provides alternative exposure. The assessment should identify both dimensions rather than assigning every gap to the clinician.

Baseline assessment also separates minimum compliance from operational proficiency. Minimum compliance may demonstrate that a provider attended training, completed a required number of attempts, or successfully performed a procedure under controlled conditions. Operational proficiency requires consistent performance under realistic conditions, including uncertainty, distraction, time pressure, and the possibility of failure (Legoux et al., 2020; Weber et al., 2024).

Not every clinician will begin at the same level or require the same development plan. An experienced critical care paramedic with recent airway exposure may need maintenance and advanced scenario practice. A clinician with limited exposure may require concentrated technical reinforcement, supervised clinical experience, or structured coaching. Baseline findings allow the agency to individualize development while maintaining common performance standards.

The purpose of baseline assessment is not to label clinicians as competent or incompetent. It is to establish an honest starting point, identify organizational weaknesses, and direct limited resources toward the areas of greatest need.

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3. Continuous Simulation and Deliberate Practice

Simulation is the most accessible method for providing repeated exposure to procedures that occur infrequently in clinical practice. Its value, however, depends on how it is designed and used. An occasional high-fidelity scenario may be memorable, but it cannot by itself prevent skill decay. Continuous competency requires practice that is sufficiently frequent, focused, and responsive to performance needs (Bienstock et al., 2022; Wheeler & Dippenaar, 2020).

Brief, high-frequency sessions can be incorporated into routine station or shift activities. An airway touchpoint lasting five to fifteen minutes might involve preparing equipment, demonstrating positioning, verbalizing an airway plan, performing a procedure, interpreting capnography, or responding to a specific complication. These activities do not need to reproduce an entire resuscitation every time. Their purpose is to maintain familiarity, reinforce critical actions, and keep procedural sequences accessible (Bienstock et al., 2022; Turan & Pekmezci, 2026).

Practice should progress in difficulty. Clinicians may begin with isolated technical components before moving to integrated scenarios involving clinical decisions, team communication, and changing patient conditions. Advanced scenarios should introduce realistic challenges such as: (Mankute et al., 2022; Paas & van Merriënboer, 2020)

- Limited physical space.
- Poor lighting or environmental noise.
- Vomitus, blood, or difficult anatomy.
- Equipment failure.

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- Interrupted preparation.
- Competing clinical priorities.
- Pediatric or obese patients.
- Declining oxygen saturation.
- Multiple unsuccessful attempts.
- Limited personnel.
- Pressure from bystanders or other responders.

These conditions increase cognitive load and require clinicians to apply technical skills while managing uncertainty and distraction. The objective is not to make every scenario unnecessarily difficult. It is to prepare clinicians gradually for the complexity of actual field performance.

Simulation should incorporate the full airway-management process. A clinician should not be evaluated only on inserting a tube. Practice should include equipment checks, patient positioning, preoxygenation, medication preparation where applicable, role assignment, verbalization of primary and backup plans, confirmation of placement, post-intubation management, and recognition of complications. Clinicians should practice deciding when not to intubate and when to transition promptly to another airway strategy.

Deliberate practice differs from simple repetition. Repeating a procedure without clear objectives or feedback may reinforce the same errors. Deliberate practice identifies a specific performance target, observes the clinician's actions, provides immediate feedback, and allows repetition until performance improves. A provider struggling with blade positioning, for example, should receive focused coaching and another attempt rather than merely completing the station and moving on (Wayne et al., 2006).

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Simulation should also be connected to actual field experience. If case review identifies delayed recognition of a displaced airway, upcoming scenarios should address airway reassessment and capnography interpretation. If clinicians encounter difficulty using a particular adjunct, training should reproduce that problem. If a new protocol or device is introduced, practice should continue until clinicians can use it reliably under realistic conditions.

This creates a direct relationship between quality improvement and education. Field performance identifies learning needs, simulation addresses them, and subsequent measurement determines whether performance improves.

4. Clinical Exposure Partnerships

Simulation is essential, but it cannot fully reproduce real patient anatomy, tissue characteristics, physiological responses, emotional pressure, or the consequences of clinical decisions. Continuous competency systems should therefore pursue meaningful clinical exposure whenever feasible (Bienstock et al., 2022; Trimmel et al., 2017).

Operating room rotations provide one of the most recognized opportunities for supervised airway experience. Partnerships with hospitals and anesthesia departments may allow paramedics to observe airway assessment, practice bag-mask ventilation, assist with airway preparation, and perform intubation under controlled supervision when organizational policies and patient consent permit. These experiences can reinforce anatomy, positioning, technique, and recognition of difficult airways (Trimmel et al., 2017).

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Clinical exposure should not be limited automatically to the operating room. Depending on local resources, regulations, and institutional policies, agencies may explore opportunities in emergency departments, intensive care units, respiratory therapy departments, specialty airway clinics, or other settings relevant to procedural competency. Cadaver laboratories can provide realistic anatomical experience and allow clinicians to practice procedures that may be difficult to reproduce accurately with standard simulation equipment.

Partnerships require more than an informal agreement. EMS agencies and clinical organizations should clarify:

- Educational objectives.
- Eligibility and prerequisite preparation.
- Supervision requirements.
- Patient consent procedures.
- Permitted clinical activities.
- Scheduling and staffing.
- Documentation.
- Liability and credentialing.
- Confidentiality.
- Methods for evaluating the experience.

The quality of exposure matters more than simple attendance. Spending several hours in an operating room without meaningful observation, participation, feedback, or documentation may contribute little to competency. Clinical rotations should have defined objectives and should record the experiences completed, feedback received, and areas requiring further development.

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Agencies without nearby hospitals, anesthesia programs, or cadaver laboratories may need regional solutions. Several EMS organizations could share a clinical coordinator, simulation facility, mobile training resource, or agreement with a regional medical center. Rural agencies may combine periodic concentrated clinical experiences with more frequent local simulation and remote case review. The framework should adapt to local capacity without abandoning the underlying objective.

Clinical partnerships can be difficult to establish because hospitals face their own staffing, liability, scheduling, and educational demands. EMS leaders should approach these relationships as collaborative patient-safety initiatives rather than requests for informal access. Hospitals also benefit when prehospital clinicians arrive with stronger assessment, ventilation, airway-management, and communication capabilities.

Clinical exposure should be documented as part of the competency record, including the type of experience, level of participation, procedures observed or performed, supervision, and feedback. These records help identify clinicians with prolonged exposure gaps and allow the organization to evaluate whether clinical partnerships are producing meaningful development.

5. Case Review, Feedback, and Coaching

Every advanced airway case provides information that cannot be obtained from simulation alone. A continuous competency system should therefore establish a structured process for reviewing all advanced airway cases, including successful procedures, unsuccessful attempts, use of alternative devices, complications, and decisions not to intubate (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

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Reviewing only poor outcomes creates a distorted picture of performance and makes quality assurance appear punitive. Successful cases can reveal effective preparation, sound judgment, strong teamwork, and practices worth reinforcing across the organization. Cases in which clinicians appropriately choose a supraglottic airway or avoid an unnecessary intubation may also demonstrate high-quality decision-making.

Case review should examine the entire episode of care, including:

- Patient presentation and airway assessment.
- Indication for airway intervention.
- Device and medication selection.
- Preoxygenation.
- Number and duration of attempts.
- Use of adjuncts.
- Confirmation of placement.
- Oxygenation and ventilation.
- Complications.
- Backup planning.
- Team communication.
- Post-procedure management.
- Patient outcome data when available.

Feedback should be timely, specific, and constructive. A clinician who receives generalized criticism several months after an event has limited opportunity to connect that feedback with the decisions made during the case. Whenever possible, initial feedback should occur soon enough for the experience to remain clear, followed by further review when additional clinical or outcome information becomes available (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

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Structured debriefing helps clinicians examine what happened, why it happened, what supported performance, and what should change. The discussion should consider individual actions, but it should also explore staffing, equipment, protocols, environmental conditions, communication, and other system factors. This approach prevents the review from becoming an exercise in assigning blame (Murray et al., 2024; Weick & Sutcliffe, 2015).

Learning review should remain separate from punitive discipline except when evidence indicates serious misconduct, dishonesty, reckless behavior, or persistent refusal to meet established expectations. Clinicians are more likely to report concerns and engage honestly when they trust that routine performance review is intended to improve care. Psychological safety strengthens accountability because it makes problems more visible.

When gaps are identified, the response should be proportionate and developmental. A coaching plan may include focused simulation, review of clinical standards, supervised practice, a clinical rotation, mentorship, or reassessment. The plan should define the performance gap, required activities, available support, expected standard, timeframe, and method of reevaluation.

Lessons should also be shared across the organization. A case involving equipment difficulty or delayed recognition of hypoxia may reveal a risk relevant to every clinician. Deidentified case summaries, training updates, shift briefings, and scenario development can distribute those lessons without exposing confidential patient or provider information.

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6. Performance Measurement and Competency Tracking

Performance measurement allows an EMS organization to determine whether its competency system is functioning as intended. Measurement should extend beyond whether a procedure was completed or whether the clinician passed an annual skills station (Makrides et al., 2023; Vithalani et al., 2022).

For airway management, relevant measures may include:

- Frequency of clinical and simulated exposure.
- Time since the clinician's last procedure.
- First-pass success.
- First-pass success without complications.
- Overall procedural success.
- Number of attempts.
- Device and adjunct selection.
- Appropriate use of backup strategies.
- Preoxygenation and oxygenation performance.
- Hypoxia, aspiration, esophageal placement, airway trauma, or other adverse events.
- Decision quality and protocol adherence.
- Simulation participation and performance.
- Clinical rotation attendance and level of participation.
- Case-review completion.
- Coaching or remediation activities.
- Improvement following intervention.

No single metric should be treated as a complete measure of competency. First-pass success is important, but it can be misleading if considered without patient condition, procedural difficulty, oxygenation, decision quality, complications, and case volume. A clinician with a high success

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percentage based on very few cases may have less current exposure than another clinician with a larger and more complex case mix. Quantitative measures should therefore be interpreted with clinical context (Makrides et al., 2023; Redlener et al., 2024).

The system should track both individual and organizational performance. Individual records support personalized development, while aggregate data reveal broader patterns. If clinicians across multiple stations demonstrate the same equipment problem, the appropriate response may be equipment redesign rather than individual remediation. If complications increase after a protocol change, the agency should evaluate the protocol, education, and implementation process.

A competency dashboard can make these data more usable. The dashboard should consolidate essential information into a clear view of exposure, training participation, clinical performance, review status, and improvement activities. It might identify clinicians who have experienced long intervals without procedural exposure, cases awaiting review, recurring system-level concerns, or areas in which performance is improving.

The purpose of a dashboard is not to reduce clinicians to a score or create a public ranking system. Competency is too complex for a single number, and poorly designed comparisons may discourage reporting or unfairly penalize clinicians with more difficult cases. Dashboard access, confidentiality, definitions, and interpretation should be governed carefully. The goal is to make important information visible enough to support timely action.

Tracking should also remain manageable. Agencies should collect data that inform decisions rather than every variable that can be recorded. An overly burdensome system will produce

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incomplete documentation and lose credibility. Measures should be clinically meaningful, clearly defined, consistently collected, and reviewed at established intervals.

7. Continuous Quality Improvement

The final component converts data into organizational learning. Collecting information does not improve performance unless the organization examines it, identifies meaningful patterns, takes action, and evaluates the results (Murray et al., 2024; Rotteau et al., 2022).

Continuous quality improvement should focus on trends rather than treating every problem as an isolated individual failure. Repeated airway difficulty may reflect insufficient practice, but it may also indicate inconsistent equipment, unclear protocols, limited clinical exposure, staffing problems, or weaknesses in team coordination. By examining multiple cases and data sources, the organization can distinguish individual development needs from broader system-design problems (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

Quality improvement findings should guide training. If case review identifies inconsistent preoxygenation, training should address preoxygenation techniques and decision-making. If data reveal delayed transition to a backup airway, simulation should require clinicians to recognize failed attempts and change strategies promptly. If clinicians consistently struggle with equipment stored differently across units, leadership should consider standardization.

Findings may also require changes beyond education. Equipment may need to be replaced or reorganized. Protocols may require clarification. Staffing patterns may need review. Documentation systems may need to capture missing information. Hospital partnerships may

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need expansion. Leadership should avoid assuming that every clinical problem can be solved by assigning another training module.

Quality improvement personnel should report relevant findings to the medical director, training staff, operational supervisors, and executive leadership. Reporting should be regular, concise, and action-oriented. Leaders need to know what patterns have emerged, what actions are proposed, who is responsible, what resources are required, and how improvement will be measured.

Each intervention should be evaluated. If an agency introduces daily airway touchpoints, it should determine whether participation occurs consistently and whether performance improves. If it establishes operating room rotations, it should examine the quality and frequency of clinical experiences. If equipment is standardized, it should assess whether preparation becomes faster and errors decrease. Without follow-up evaluation, an organization may continue investing in activities that produce little benefit (Adelgais et al., 2019; von Vopelius-Feldt et al., 2023).

The improvement process should therefore follow a recurring sequence:

1. Collect information from clinical cases, simulation, exposure records, and competency assessments.
2. Identify individual and organizational patterns.
3. Select a targeted intervention.
4. Implement the intervention.
5. Measure its effects.
6. Refine, expand, or replace the intervention based on the findings.

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This cycle is what makes the competency system continuous. Leadership establishes the conditions for readiness. Standards define expected performance. Baseline assessment identifies needs. Simulation and clinical exposure develop capability. Case review and coaching strengthen learning. Performance tracking makes changes visible. Quality improvement uses the findings to modify the system.

The components do not operate in isolation. They form a coordinated structure through which EMS organizations can identify declining readiness before it becomes a patient-safety event. The result is not simply a larger training program. It is an organizational capability for sustaining performance over time (Rotteau et al., 2022; Weick & Sutcliffe, 2015).

How the System Operates as a Continuous Cycle

The individual components of a continuous competency system provide value, but none is sufficient by itself. Training without clinical exposure may strengthen technique without ensuring transfer to patient care. Clinical experience without feedback may reinforce ineffective habits. Feedback without performance tracking may address a single case while overlooking broader patterns. Measurement without leadership support may identify problems that the organization lacks the authority, resources, or commitment to correct (Rotteau et al., 2022; Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

The strength of the system comes from the connections among its components. Each stage generates information or experience that informs the next, creating an ongoing cycle of development and organizational learning:

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Training → Exposure → Feedback → Performance Tracking → Leadership Support → Training

This cycle does not have a fixed beginning or end. An organization may enter it through a training initiative, a clinical case, a performance review, or a leadership decision. Once established, however, the cycle should operate continuously. Each stage strengthens the others and produces the information needed to guide the next round of improvement.

Training

Training provides the structured foundation for competency development. It establishes clinical standards, reinforces technical skills, introduces equipment and protocols, and allows clinicians to practice decision-making in a controlled environment. Within a continuous system, training is not limited to annual recertification or occasional large-scale exercises. It includes brief, frequent practice, progressive simulation, targeted coaching, and scenario-based learning (Bienstock et al., 2022; Nielsen et al., 2021; Wheeler & Dippenaar, 2020).

Training should be guided by evidence from field performance. Rather than relying exclusively on a predetermined annual curriculum, educators should use case reviews, exposure records, dashboard findings, and clinician feedback to identify current learning needs. If performance data reveal delayed transition to a backup airway, upcoming simulation should address failure recognition and alternative airway planning. If field reviews identify inconsistent capnography use, training should reinforce placement confirmation and continuous waveform interpretation.

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Effective training therefore prepares clinicians for clinical exposure while remaining responsive to what the organization learns from actual patient care (Carter et al., 2022; von Vopelius-Feldt et al., 2023).

Exposure

Exposure allows clinicians to apply knowledge and technical skills in realistic conditions. It may occur through field cases, hospital rotations, operating room experiences, cadaver laboratories, high-fidelity simulation, or other supervised clinical opportunities. Exposure introduces the variation, uncertainty, physiological response, and emotional pressure that cannot be completely reproduced through classroom instruction (Newton & Smith, 2024; Trimmel et al., 2017).

The system should consider both the amount and quality of exposure. Merely attending a clinical rotation or completing a simulation does not necessarily produce meaningful development. The experience should involve clear objectives, appropriate participation, observation, supervision, and reflection.

Field exposure is naturally uneven. One clinician may encounter several difficult airways in a short period, while another may go months or years without performing an intubation. A continuous system makes these differences visible. It does not assume that every clinician receives sufficient experience simply because the organization responds to an adequate number of cases collectively (Dyson et al., 2017; Thomas et al., 2024).

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Exposure also generates the evidence needed for feedback. Every procedure, simulation, clinical rotation, and complex decision creates an opportunity to examine performance and identify what should be reinforced or improved.

Feedback

Experience alone does not guarantee learning. Without feedback, clinicians may repeat ineffective techniques, misinterpret successful outcomes, or remain unaware of gaps in their performance (Legoux et al., 2020; Vithalani et al., 2022). Feedback connects experience to improvement by helping clinicians understand what occurred, why it occurred, and what should be done differently in the future.

Feedback should be timely, specific, constructive, and connected to established competency standards. It may come from a training officer, medical director, supervisor, clinical preceptor, peer, quality improvement reviewer, or structured self-reflection process. Whenever possible, it should address both effective performance and areas requiring development.

The organization should also distinguish between individual and system-level feedback. A difficult airway case may reveal a clinician's need for additional practice, but it may also expose poorly organized equipment, an unclear protocol, inadequate staffing, or ineffective team communication. The purpose of feedback is not simply to judge the clinician. It is to understand the conditions that shaped performance (Meadley et al., 2023; Murray et al., 2024).

Feedback should lead to an identifiable response. That response may involve reinforcement of effective practice, targeted simulation, clinical coaching, equipment changes, policy clarification,

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or further review. Without a pathway from feedback to action, debriefing becomes conversation rather than improvement.

Performance Tracking

Performance tracking converts individual experiences into information that can be examined over time. It allows the organization to identify whether exposure is sufficient, feedback is occurring, interventions are being completed, and performance is improving.

The system should track a balanced set of indicators, including procedural exposure, time since last performance, simulation participation, clinical rotations, first-pass success, complications, decision quality, feedback completion, and response to coaching or remediation. These measures should be interpreted together rather than reduced to a single competency score (Makrides et al., 2023; Vithalani et al., 2022).

Tracking also allows leaders to distinguish isolated events from recurring patterns. A single unsuccessful procedure may reflect patient complexity. Repeated difficulty across several clinicians may indicate a training, equipment, protocol, or system-design problem. Similarly, improvement following targeted simulation may demonstrate that an intervention should be continued or expanded (Carter et al., 2022; von Vopelius-Feldt et al., 2023).

A competency dashboard can make these relationships visible. It can show whether clinicians are receiving sufficient practice, whether cases have been reviewed, where exposure gaps exist, and whether improvement efforts are producing results. The dashboard should function as a decision-support tool, not a ranking or disciplinary mechanism (Alhur, 2024; Meadley et al., 2023).

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Performance tracking closes the gap between assumption and evidence. Instead of assuming that training was effective or that competency remains current, leaders can evaluate whether the system is producing the intended outcomes.

Leadership Support

Leadership support turns information into organizational action. Performance data may reveal that clinicians need more frequent practice, but leaders must authorize the time and resources required to provide it. Case reviews may identify equipment inconsistency, but leadership must approve standardization. Exposure records may reveal insufficient clinical opportunities, but executives and medical directors must establish partnerships or develop alternatives.

Leadership support includes setting priorities, assigning responsibilities, protecting training time, providing resources, strengthening clinical partnerships, and maintaining a nonpunitive learning culture. It also includes holding the system accountable (Murray et al., 2024; Rotteau et al., 2022; Weick & Sutcliffe, 2015). Leaders should expect regular reporting, evaluate whether interventions are implemented, and ensure that identified risks are not allowed to remain unresolved.

Leadership should not be positioned outside the competency cycle as a distant source of approval. It is an active component of the cycle. Leaders receive information from performance tracking, determine what organizational changes are required, and direct resources toward the next round of training and development.

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This returns the system to training, but not to the same training that occurred previously. The next training cycle should be more targeted because it is informed by actual exposure, feedback, and performance data. In this way, leadership support completes one cycle and initiates the next.

The Connections Create the System

Each component becomes more effective when connected to the others:

- **Training prepares clinicians for exposure.**
- **Exposure produces experience that can be examined.**
- **Feedback converts experience into learning.**
- **Performance tracking identifies patterns and changing needs.**
- **Leadership support converts evidence into resources and action.**
- **The next cycle of training responds to what the system has learned.**

If one connection fails, the cycle weakens. Training may continue without addressing real performance needs. Clinical experiences may occur without generating feedback. Feedback may be provided without documentation or follow-up. Data may be collected without influencing leadership decisions. Leaders may support training without knowing whether it improves performance.

For this reason, implementation should not be judged solely by the presence of individual activities. An agency may have simulation equipment, clinical partnerships, quality assurance personnel, and a medical director yet still lack a continuous competency system. The defining feature is whether information and responsibility move reliably among these functions.

The cycle also operates at both the individual and organizational levels. For the individual clinician, it provides repeated practice, exposure, feedback, and targeted development. For the

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organization, it reveals patterns, identifies system weaknesses, guides resource allocation, and supports continuous quality improvement (Bobel et al., 2025; Vithalani et al., 2022). The same cycle that strengthens one clinician's performance also helps the agency become more capable of sustaining readiness across its workforce.

Ultimately, the continuous competency cycle replaces a static question, "Has this clinician completed the required training?" with a more meaningful one:

What does the organization currently know about readiness, and what must happen next to strengthen it?

That question keeps the system active. Competency is practiced, applied, reviewed, measured, supported, and practiced again. Readiness is not presumed between annual evaluations. It is continuously maintained through an organizational cycle designed to learn from every training activity, clinical exposure, and patient encounter (see Figure 2).

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Figure 2. The Continuous Competency Cycle

Clinical readiness is sustained through the recurring integration of training, procedural and clinical exposure, structured feedback, performance tracking, and leadership support. Information generated at each stage guides the next, allowing the system to respond continuously to individual and organizational needs.

Roles and Responsibilities

A continuous competency system requires shared responsibility, but shared responsibility does not mean undefined responsibility (see Figure 3). Each participating group must understand what

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it owns, how its work connects with other functions, and who is accountable when required activities do not occur. Without clear role definition, training, case review, clinical partnerships, and performance improvement can become dependent on informal initiative rather than reliable organizational processes (McLaney et al., 2022; Murray et al., 2024; Rotteau et al., 2022).

The exact distribution of responsibilities will vary according to agency size and structure. Large EMS systems may have separate clinical education, quality improvement, data analysis, and medical oversight teams. Smaller or rural agencies may assign several functions to one person or coordinate them regionally. Regardless of structure, the responsibilities themselves must be addressed.

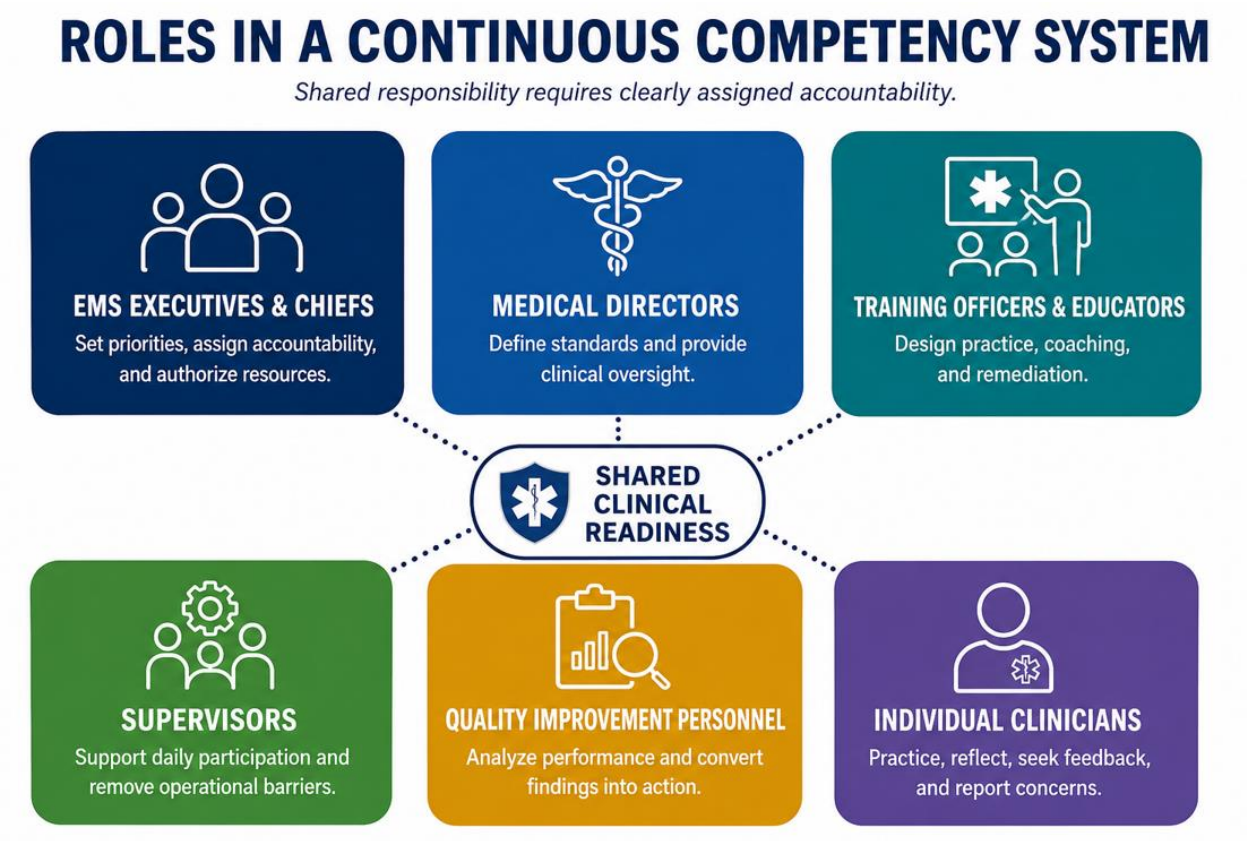

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Figure 3. Roles in a Continuous Competency System

EMS Executives and Chiefs

EMS executives and chiefs provide organizational authority for the competency system. Their principal responsibility is to establish sustained clinical readiness as an operational priority rather than an optional educational activity (Murray et al., 2024; Weick & Sutcliffe, 2015).

Leaders should define the organization's goals, approve implementation policies, assign accountability, and determine how progress will be reported. A specific person or team should be responsible for coordinating the system, but executive leadership retains responsibility for ensuring that it functions.

Executives must also authorize the resources necessary for implementation. These may include protected training time, staffing or backfill, simulation equipment, data systems, educator capacity, clinical rotations, and external consultation. Not every resource must be secured before implementation begins, but leaders should identify what is required for each phase and avoid imposing expectations that personnel cannot reasonably fulfill.

Organizational performance should be reviewed at established intervals. Executives do not need access to every clinical detail, but they should receive concise reports describing participation, exposure gaps, performance patterns, unresolved risks, implementation barriers, and the results of improvement efforts. Their role is to ensure that findings lead to decisions rather than remaining within training or quality improvement departments (Rotteau et al., 2022; Vithalani et al., 2022).

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Executives and chiefs are also important representatives in external partnerships. Hospital agreements, anesthesia collaborations, regional training arrangements, academic partnerships, and funding applications often require executive support. Leadership involvement signals that the proposed partnership is an organizational commitment rather than an informal project.

Medical Directors

Medical directors establish the clinical foundation of the competency system. They should define or approve clinical expectations, procedural standards, decision-making criteria, and patient-safety measures. These expectations must be consistent with current evidence, local protocols, scope-of-practice requirements, and the operational environment (MacDonald et al., 2018; Vithalani et al., 2022).

Medical directors should participate in reviewing aggregate performance data, significant clinical cases, complications, and patient outcomes when available. Their role is not limited to determining whether a procedure technically succeeded. They should also help evaluate whether the procedure was indicated, whether the selected approach was appropriate, how effectively complications were managed, and whether care met the organization's clinical standards.

Case review and remediation require meaningful medical oversight. Medical directors should help distinguish an understandable performance gap from unsafe practice, approve clinical remediation plans, and determine when a clinician has demonstrated sufficient improvement. Their involvement provides clinical legitimacy and helps ensure that remediation is proportionate, evidence-informed, and focused on patient safety (Meadley et al., 2023; Vithalani et al., 2022).

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Medical directors can also facilitate hospital relationships. Their professional connections may help agencies establish operating room rotations, emergency department experiences, anesthesia partnerships, or access to specialty training. They can communicate the clinical purpose of these arrangements and help resolve concerns related to supervision, liability, patient consent, and educational standards.

Training Officers and Educators

Training officers and educators translate competency standards and performance findings into structured learning. They should design a continuous simulation program that combines brief, frequent practice with more complex scenarios and periodic competency assessments (Bienstock et al., 2022; Nielsen et al., 2021; Wheeler & Dippenaar, 2020).

Training should address technical performance, clinical judgment, communication, equipment use, complication management, and backup planning. Educators should vary scenario difficulty and reproduce realistic conditions such as limited space, distraction, equipment problems, and deteriorating patients. Training design should remain responsive to information from clinical cases and quality improvement data (Mankute et al., 2022; Newton & Smith, 2024; Zaphir et al., 2024).

Educators are also responsible for maintaining accurate training records. Documentation should identify what activities occurred, which competencies were addressed, how the clinician performed, what feedback was provided, and whether follow-up is required. Records should support development without becoming an administrative exercise disconnected from clinical improvement.

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Performance data should shape educational priorities. If case review identifies recurring difficulty with preoxygenation, capnography interpretation, or transition to a backup airway, educators should incorporate those issues into upcoming practice. If specific clinicians have prolonged exposure gaps, training can be individualized accordingly.

When gaps are identified, educators should provide coaching and targeted remediation. Effective remediation should define the concern, provide focused instruction and repeated practice, establish an expected performance standard, and document improvement. The objective is not simply to require the clinician to repeat an entire course. It is to address the specific knowledge, skill, judgment, or equipment-familiarity gap that affected performance (Carter et al., 2022; Legoux et al., 2020).

Supervisors

Field supervisors connect organizational expectations with daily operations. They are often the individuals best positioned to determine whether the competency system becomes part of routine practice or remains limited to formal training days.

Supervisors should reinforce consistent participation and facilitate brief, shift-based practice when operational conditions allow. This may involve prompting an airway touchpoint, coordinating a short equipment exercise, assigning scenario roles, or ensuring that missed activities are rescheduled. Supervisors do not need to become full-time instructors, but they should understand the purpose of the exercises and support their consistent completion.

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They should also identify operational barriers. Staffing shortages, high call volume, inaccessible equipment, inconsistent supplies, scheduling conflicts, and unclear expectations can prevent participation. Supervisors should document these barriers and communicate them to training staff and leadership rather than allowing missed activities to become routine.

Supervisors help shape organizational culture through their response to questions, mistakes, and requests for assistance. A supervisor who treats practice as unimportant or ridicules a clinician for acknowledging uncertainty can undermine the entire system. Conversely, a supervisor who participates, encourages honest discussion, and reinforces improvement helps create a learning-oriented environment (Murray et al., 2024; Weick & Sutcliffe, 2015).

Supervisors may also support immediate post-case reflection. They should recognize when a formal clinical review is necessary, preserve relevant information, and ensure that clinicians receive appropriate support following difficult cases.

Quality Improvement Personnel

Quality improvement personnel provide the analytical connection between clinical performance and organizational action (Makrides et al., 2023; Vithalani et al., 2022). They should collect data from patient care records, simulation activities, exposure records, clinical rotations, case reviews, and remediation processes.

Data collection should be consistent and focused on clinically meaningful measures. Quality improvement personnel should establish clear definitions, identify missing or unreliable information, and work with operational and education teams to improve documentation. The

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objective is not to collect every available data point but to produce information that supports decisions.

Analysis should identify trends rather than focus solely on isolated outcomes. Patterns may involve recurring complications, differences among units or shifts, prolonged exposure gaps, delayed case reviews, equipment inconsistencies, or weaknesses in protocol implementation. Findings should distinguish, as far as possible, between individual development needs and system-level conditions (Makrides et al., 2023; von Vopelius-Feldt et al., 2023).

Quality improvement personnel should coordinate case review by gathering relevant records, arranging participation, documenting findings, and tracking recommended actions. They must protect patient and provider confidentiality and ensure that access to identifiable information is limited to those with a legitimate operational or clinical need (Pascale et al., 2022; Scheibner et al., 2022).

Reporting should be concise and actionable. Rather than distributing large volumes of data without interpretation, quality improvement personnel should identify what the information suggests, what risks or opportunities require attention, and what follow-up should occur. Reports should reach training personnel, supervisors, medical directors, and executive leadership according to their responsibilities.

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Individual Clinicians

Individual clinicians remain active participants in maintaining their readiness. An organizational system provides opportunity, structure, and support, but it cannot replace professional engagement.

Clinicians should participate consistently in simulation, clinical rotations, case review, coaching, and required assessments. Participation should involve purposeful practice rather than simple attendance (Wayne et al., 2006; Wheeler & Dippenaar, 2020). Clinicians should use these opportunities to identify limitations, ask questions, and strengthen both technical and decision-making performance.

Reflection is an important professional responsibility. After a training exercise or clinical case, clinicians should consider what went well, what was difficult, how effectively the team functioned, and what they would do differently. Honest self-assessment helps direct coaching and improves the quality of formal review (Brookfield, 1986; Meadley et al., 2023).

Clinicians should actively seek and respond to feedback. Receiving corrective feedback can be uncomfortable, but continuous competency depends on a willingness to examine performance without becoming defensive. Clinicians should also provide constructive feedback to peers and contribute to a culture in which improvement is expected and supported (McLaney et al., 2022; Myhr et al., 2024).

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Maintaining readiness includes familiarity with equipment, protocols, medications, backup plans, and changes in clinical practice. Clinicians should complete assigned development activities and communicate when they believe additional practice or assistance is needed.

They also have a responsibility to report system and equipment concerns. Missing supplies, inconsistent airway layouts, malfunctioning equipment, unclear protocols, unsafe staffing conditions, or documentation problems can affect every provider. Reporting these concerns allows the organization to address risks before they contribute to patient harm.

Responsibility Matrix

Role	Primary Responsibilities	Evidence of Accountability
EMS executives and chiefs	Establish priorities, assign ownership, authorize resources, monitor organizational performance, and support external partnerships	Approved policies, designated system leadership, resource allocation, regular performance review, and partnership agreements
Medical directors	Define clinical standards, review performance and outcomes, oversee case review and remediation, and facilitate clinical partnerships	Approved competency standards, documented medical oversight, remediation decisions, and hospital collaboration
Training officers and educators	Design continuous simulation, maintain training records, translate performance data into education, and provide coaching	Training schedules, participation records, targeted scenarios, competency assessments, and completed development plans
Supervisors	Reinforce participation, facilitate shift-based practice, identify operational barriers, and support a learning culture	Completed shift activities, documented barriers, rescheduled opportunities, and appropriate referral of cases or concerns
Quality improvement personnel	Collect and analyze data, identify trends, coordinate	Complete data records, timely case reviews, trend reports,

	case review, protect confidentiality, and report findings	protected information, and tracked corrective actions
Individual clinicians	Participate, reflect, seek feedback, maintain readiness, and report system concerns	Consistent participation, completed development activities, demonstrated improvement, and timely reporting of risks

Shared Responsibility With Clear Accountability

The competency system depends on collaboration, but every activity should have an identifiable owner. Leadership must provide authority and resources. Medical directors must establish clinical legitimacy. Educators must convert identified needs into development. Supervisors must support daily execution. Quality improvement personnel must make performance visible. Clinicians must engage honestly and consistently.

Failure in one role affects the entire cycle. Training officers cannot protect time that leadership refuses to authorize. Quality improvement personnel cannot analyze data that clinicians and supervisors do not document. Medical directors cannot oversee improvement if significant cases are never reviewed. Clinicians cannot maintain readiness if the organization provides no meaningful opportunities to practice or receive feedback.

Clear responsibilities prevent these failures from being treated as someone else's problem. They also allow EMS agencies to determine where implementation has stalled and what organizational support is needed. Continuous competency becomes sustainable when responsibility is distributed across the organization, accountability is explicit, and every role contributes to the shared objective of continuous clinical readiness.

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A Phased Implementation Model

Building a continuous competency system does not require an EMS agency to transform every training, clinical, and quality improvement process at once. Attempting an immediate organization-wide implementation may overwhelm personnel, expose unresolved workflow problems, and create resistance before the model has demonstrated its value. A phased approach allows the agency to begin with a defined clinical priority, test the system under operational conditions, learn from early implementation, and expand based on evidence (Adelgais et al., 2019; Liu et al., 2021; Rotteau et al., 2022).

The five phases are Assess, Design, Pilot, Implement, and Evaluate and Improve (see Figure 4). Although presented sequentially, the model should remain flexible. New information may require the agency to return to an earlier phase, revise an assumption, or adjust the scope of implementation. This is not a failure of the model. It is a normal part of developing a system that fits the organization's actual needs, resources, and operating environment (Adelgais et al., 2019; Bobel et al., 2025).

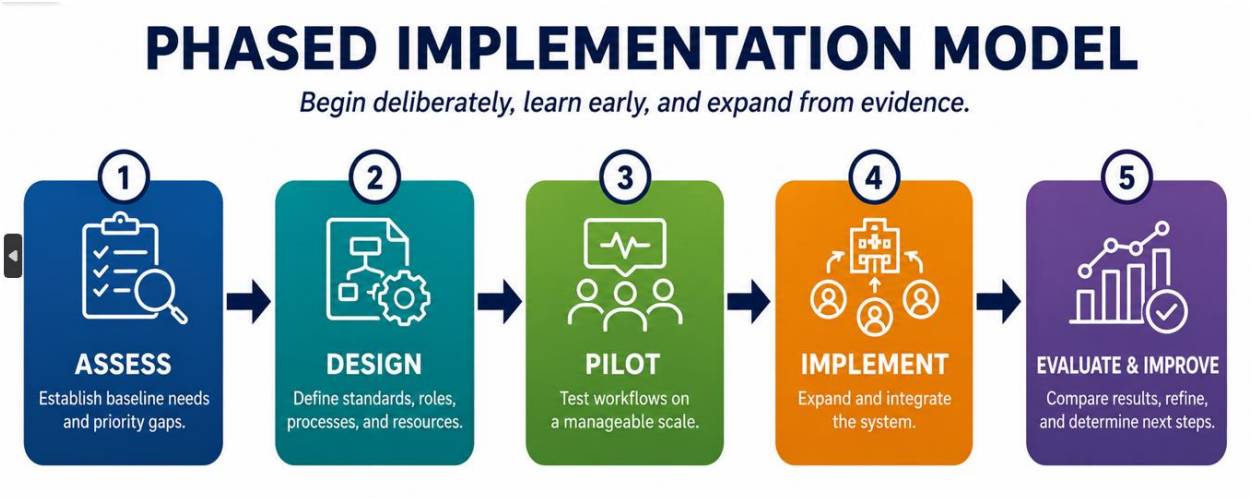

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Figure 4. The Phased Implementation Model

Phase 1: Assess

Implementation should begin with an honest assessment of the organization's current competency infrastructure. Most EMS agencies will not be starting from nothing. They may already conduct annual skills verification, provide simulation, review selected cases, track procedural success, or participate in hospital-based education. The purpose of assessment is to determine what exists, how consistently it operates, and whether its components are connected (Bobel et al., 2025; Rotteau et al., 2022).

The assessment should examine several areas.

Training: How frequently do clinicians practice high-acuity, low-frequency procedures? Does training include realistic decision-making and team performance, or is it primarily technical verification? Are identified clinical problems incorporated into future training?

Clinical exposure: How often do clinicians perform the procedure in the field? How evenly are opportunities distributed? Does the agency provide operating room rotations, hospital experiences, cadaver training, or other forms of supervised clinical exposure?

Quality assurance: Which cases are reviewed, who reviews them, and how quickly does review occur? Is feedback consistently provided? Are successful cases examined as well as complications and failures?

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Leadership and governance: Has competency maintenance been established as an organizational priority? Are responsibilities clearly assigned? Do supervisors protect participation, and does leadership review performance findings?

Equipment and operational systems: Is equipment standardized, available, functional, and familiar to clinicians? Do storage configurations, replacement practices, or differences among units create unnecessary cognitive burden?

Data systems: What information is collected about exposure, procedural performance, simulation, clinical rotations, complications, case review, and remediation? Can these records be connected, analyzed, and converted into actionable findings (Alhur, 2024; Makrides et al., 2023; Vithalani et al., 2022)?

The assessment should include both quantitative and qualitative information. Existing records can establish training frequency, procedural exposure, success rates, complications, and review completion. Interviews, surveys, focus groups, or structured discussions can reveal barriers that may not appear in the data, such as scheduling problems, limited psychological safety, inconsistent supervisory support, or lack of confidence in the review process (Adelgais et al., 2019; Murray et al., 2024).

Baseline measures should be established before changes are introduced. These may include:

- Frequency and recency of procedural exposure.
- Training participation.
- Simulation performance.
- First-pass and overall procedural success.
- Complications and adverse events.

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- Percentage of eligible cases reviewed.
- Time from clinical case to feedback.
- Participation in clinical rotations.
- Equipment consistency and readiness.
- Clinician perceptions of support, feedback, and psychological safety.

The agency should then identify its highest-priority gaps. Priority should reflect clinical risk, frequency of observed problems, feasibility of intervention, and potential benefit to patients and clinicians (Vithalani et al., 2022; Wang, 2023). The assessment should conclude with a concise statement of what requires attention, why it matters, and which gaps should be addressed first.

Phase 2: Design

The design phase converts assessment findings into a defined operating model. The agency should resist the temptation to create a broad program that attempts to address every clinical procedure simultaneously. Initial design should focus on a manageable priority for which the organization can establish clear standards, provide meaningful practice, and collect reliable data.

Airway management may be an appropriate starting point because it combines technical skill, clinical judgment, equipment use, team coordination, and significant patient-safety risk. Another agency may identify a different priority based on its local data, protocols, workforce, or patient population.

The organization should first define competency standards. These standards should describe the knowledge, technical actions, clinical decisions, communication behaviors, and safety measures expected during performance. They should extend beyond procedural completion and address

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preparation, appropriate patient selection, backup planning, complication management, and post-procedure care (Carney et al., 2021; Vithalani et al., 2022).

The design phase should also assign responsibility. Each major activity should have an identifiable owner:

- Who coordinates the system?
- Who designs and delivers simulation?
- Who monitors participation?
- Who reviews clinical cases?
- Who analyzes performance data?
- Who provides feedback?
- Who approves remediation plans?
- Who reports findings to leadership?
- Who authorizes changes when system problems are identified?

Simulation and case-review processes should be designed together. Training frequency, scenario progression, documentation, feedback, and reassessment should be defined. Case-review criteria, timelines, participants, confidentiality protections, and follow-up procedures should also be established. Most importantly, the design should specify how case-review findings will influence future training (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

Required resources and partnerships should be identified during this phase. These may include:

- Simulation equipment and supplies.
- Protected training time.
- Instructor or preceptor capacity.
- Data collection and reporting tools.
- Hospital or anesthesia partnerships.

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- Operating room or clinical rotations.
- Cadaver laboratory access.
- Medical director participation.
- Staffing or backfill.
- Funding and administrative support.

The design should be sufficiently detailed to guide a pilot but not so rigid that early lessons cannot influence it. The objective is to create a workable initial model, not a perfect final system.

Phase 3: Pilot

The pilot phase tests the proposed system on a controlled scale. An agency may begin with one procedure, station, shift, geographic area, or provider group. The pilot should be large enough to reveal operational problems but small enough to manage closely (Adelgais et al., 2019; Liu et al., 2021).

A focused pilot allows the agency to test whether planned workflows function in practice. Questions may include:

- Can brief simulation be completed during routine operations?
- Are instructors and supervisors applying standards consistently?
- Can relevant clinical cases be identified and reviewed promptly?
- Do clinicians receive useful feedback?
- Can exposure, participation, and performance data be captured reliably?
- Are clinical partnerships producing meaningful experiences?
- Do coaching and remediation processes function as intended?
- Are responsibilities clear?
- What staffing, scheduling, equipment, or cultural barriers emerge?

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Participation and performance data should be collected from the beginning. However, early pilot findings should be interpreted cautiously. The first objective is to evaluate feasibility, adoption, and workflow reliability (Liu et al., 2021; Rotteau et al., 2022). A small or short pilot may not include enough clinical cases to demonstrate changes in patient outcomes. It can still show whether training occurs, cases are reviewed, feedback is delivered, records are complete, and personnel engage with the system.

Pilot participants should have structured opportunities to describe their experience. Clinicians, supervisors, educators, quality improvement personnel, and medical directors may identify burdens or unintended consequences that are not visible in formal performance measures. Their feedback can help simplify documentation, improve scheduling, clarify responsibilities, and strengthen psychological safety (Adelgais et al., 2019; Murray et al., 2024).

Operational obstacles should be documented rather than treated as isolated inconveniences. Repeatedly missed practice sessions may indicate inadequate staffing or unrealistic scheduling. Delayed case review may reveal problems with data access or unclear ownership. Inconsistent feedback may reflect insufficient educator preparation. The pilot should expose these weaknesses while the organization can still address them on a limited scale.

Before expansion, the agency should refine the model. Processes that work should be standardized. Activities that create burden without producing useful information should be revised or removed. Additional resources, training, or leadership action should be secured where needed.

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Phase 4: Implement

Once the pilot demonstrates that the model is workable, the agency can expand it across the organization. Expansion should be deliberate and may occur incrementally by station, shift, division, or provider group rather than through a single launch.

Implementation requires standardization. Clinicians should receive consistent expectations regardless of work location or supervisor. Training activities, competency standards, documentation practices, case-review procedures, and performance measures should be applied as uniformly as possible. Necessary local adaptations should be documented so that variation is intentional rather than accidental (Adelgais et al., 2019; Liu et al., 2021).

The principal functions should now operate as one integrated system:

- Training prepares clinicians for clinical performance.
- Clinical exposure generates experience.
- Case review produces feedback.
- Performance tracking identifies individual and organizational patterns.
- Leadership uses those findings to authorize improvement.
- New training responds to what the system has learned.

Communication is essential during expansion. Personnel should understand why the system is being implemented, what activities are required, how performance information will be used, who can access identifiable data, and how coaching differs from discipline. If these questions are left unanswered, clinicians may interpret competency tracking as surveillance or punishment (Meadley et al., 2023; Murray et al., 2024).

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Responsibilities should be communicated in writing and reinforced through orientation, supervisory practice, and leadership reporting. Personnel assuming new roles may require preparation in simulation facilitation, structured debriefing, data interpretation, coaching, or confidentiality.

Implementation should also include a process for reporting barriers. Expansion may reveal challenges that did not appear during the pilot, particularly across locations with different call volumes, staffing patterns, leadership practices, or access to clinical partners. The organization should respond quickly so that inconsistent adoption does not become embedded.

Phase 5: Evaluate and Improve

Implementation is not complete when the system has been launched. The agency must determine whether the model is being adopted, whether it improves readiness, and whether it produces measurable clinical and organizational value (Makrides et al., 2023; Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

Results should be compared with the baseline established during Phase 1. Evaluation should include several categories.

Participation measures assess whether clinicians and organizational units are engaging with the system. These may include simulation completion, clinical rotation participation, case-review rates, feedback completion, and adherence to documentation requirements.

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Performance measures assess whether technical execution, clinical judgment, and reliability are improving. These may include first-pass success, complication-free success, appropriate device selection, decision quality, simulation performance, and improvement following coaching.

Safety measures examine hypoxia, aspiration, airway trauma, misplaced devices, delayed backup strategies, or other clinically relevant events.

Organizational adoption measures assess whether supervisors protect participation, educators use performance data, medical directors participate in review, leadership responds to findings, and personnel view the process as fair and useful.

Evaluation should consider both results and implementation conditions. If outcomes do not improve, the agency should determine whether the intervention itself was ineffective or whether it was never implemented consistently (Liu et al., 2021; Rotteau et al., 2022). Low participation, incomplete data, delayed feedback, or inadequate leadership support can weaken an otherwise reasonable model.

Findings should be used to revise training, policies, equipment, documentation, partnerships, and workflow. The agency may increase practice frequency, redesign scenarios, clarify clinical standards, improve data collection, strengthen coaching, or adjust responsibilities. Changes should be documented and evaluated during the next cycle (Rotteau et al., 2022; Weick & Sutcliffe, 2015).

Once the system demonstrates acceptable feasibility and value, leaders can consider expansion to additional procedures. Expansion should be based on clinical risk, exposure frequency, available

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resources, and evidence that the organization can sustain the existing system (Adelgais et al., 2019; Weber et al., 2024). Potential additions may include intraosseous access, chest decompression, cricothyrotomy, complicated childbirth, pediatric resuscitation, ventilator management, or specialized medication and infusion management.

Implementation as Organizational Learning

The five phases provide a disciplined pathway from concept to sustained practice:

Assess → Design → Pilot → Implement → Evaluate and Improve

The phased model reduces the risks associated with an immediate systemwide overhaul. It allows the agency to begin with evidence, test assumptions, correct weaknesses, and build internal support before committing to broader expansion (Adelgais et al., 2019; Rotteau et al., 2022). It also produces information that can support budgeting, grant applications, clinical partnerships, and leadership decisions.

Most importantly, phased implementation reflects the same principle as continuous competency itself. The organization does not assume that its initial design will remain effective indefinitely. It assesses, acts, measures, learns, and improves (Murray et al., 2024; Weick & Sutcliffe, 2015). In doing so, implementation becomes more than the introduction of a new training program. It becomes the development of an organizational system capable of sustaining clinical readiness over time.

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Practical Implementation Considerations

A continuous competency system is operationally achievable, but it is not effortless. It requires leadership attention, protected time, defined responsibilities, reliable data, and sustained coordination among operations, education, quality improvement, medical direction, and external clinical partners. Agencies that underestimate these requirements may launch a promising initiative that gradually loses participation and organizational support (Adelgais et al., 2019; Rotteau et al., 2022).

The purpose of implementation planning is not to eliminate every barrier before beginning. That standard would prevent many agencies from ever moving forward. The objective is to identify foreseeable constraints, determine which are critical, and design an initial model that the organization can realistically sustain.

Staffing and Scheduling

Staffing is likely to be one of the first concerns raised by EMS leaders. Agencies already facing vacancies, mandatory overtime, high call volume, and limited unit availability may struggle to protect time for simulation, clinical rotations, case review, and coaching (Powell et al., 2025; Thielmann et al., 2022; Zarei et al., 2026).

Brief, shift-based practice can reduce some of this burden. A five- to fifteen-minute exercise is easier to incorporate into operations than a recurring multi-hour class, while frequent simulation and deliberate practice can support skill development and retention (Bienstock et al., 2022; Legoux et al., 2020; Wayne et al., 2006). However, even short activities can be interrupted by

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calls or competing duties. Agencies should establish realistic completion windows, allow missed activities to be rescheduled, and avoid treating interruptions as noncompliance.

Longer simulations, clinical rotations, and remediation require more deliberate scheduling. Leaders should examine call-volume patterns, shift structures, training calendars, and existing meeting requirements to identify opportunities. Implementation may begin with one shift, station, or provider group so that scheduling problems can be identified before expansion.

The system should not depend on clinicians consistently completing required activities during unpaid personal time. That approach transfers an organizational responsibility to individual employees, creates inequity, and is unlikely to remain sustainable.

Overtime and Backfill

Protected participation may require overtime or backfill, particularly for clinical rotations, instructor preparation, remediation, and longer simulation exercises. These costs should be estimated during the assessment and design phases rather than discovered after implementation.

Agencies may control costs by using phased scheduling, rotating participation, combining activities with existing education days, and incorporating brief practice into compensated duty time. Regional collaboration may allow several organizations to share instructors, facilities, or clinical coordinators (Adelgais et al., 2019; Bobel et al., 2025).

Overtime should be used strategically. Paying clinicians to attend poorly structured clinical rotations or repetitive training that does not address identified needs wastes both money and

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goodwill. Each compensated activity should have defined objectives, appropriate supervision, and documentation of participation and outcomes.

External funding may help support initial implementation, equipment acquisition, staffing, or evaluation. However, the long-term model should not rely entirely on temporary grant funding. Leaders should identify which recurring costs the organization must eventually absorb and how those costs will be incorporated into future budgets.

Instructor Capacity

Continuous practice increases demand for instructors, evaluators, coaches, and debriefing facilitators. Many agencies have a small education staff already responsible for orientation, certification requirements, protocol updates, documentation, and continuing education.

The solution is not necessarily to require the training division to personally conduct every activity. Agencies can develop qualified field preceptors, supervisors, or clinical champions to facilitate brief standardized exercises. Clear instructor guides, performance criteria, and debriefing prompts can support consistency while expanding capacity (Mankute et al., 2022; Nielsen et al., 2021).

Personnel assigned to these roles require preparation. Clinical experience alone does not automatically make someone an effective educator or coach (Bienstock et al., 2022; Wheeler & Dippenaar, 2020). Facilitators should understand deliberate practice, observation, constructive feedback, psychological safety, documentation, and when a concern requires referral to the training officer or medical director.

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The organization should also account for preparation time. Scenarios must be designed, equipment maintained, performance reviewed, and records completed. If these duties are simply added to existing workloads without protected capacity, implementation quality will decline.

Hospital Access and Clinical Partnerships

Hospital and anesthesia partnerships can provide valuable clinical exposure, but access may be difficult to obtain (Trimmel et al., 2017; von Vopelius-Feldt et al., 2023). Hospitals must consider patient consent, liability, credentialing, infection control, supervision, scheduling, and competing demands from medical, nursing, respiratory therapy, and other learners.

EMS agencies should approach potential partners with a clear proposal. The request should identify the educational purpose, participant qualifications, supervision requirements, permitted activities, documentation processes, insurance coverage, and anticipated benefit to patient care. Executive and medical director involvement can give the proposal greater credibility.

Agencies should not assume that every clinical rotation will include an intubation. Procedure availability depends on patient volume, clinical appropriateness, institutional policy, and the supervising clinician. Rotation objectives should therefore include airway assessment, positioning, bag-mask ventilation, equipment preparation, observation, decision-making, and feedback rather than defining success solely by the number of tubes placed (Carney et al., 2021; Trimmel et al., 2017).

If operating room access is unavailable, agencies should consider other options, including emergency department observation, respiratory therapy collaboration, cadaver laboratories,

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regional simulation centers, academic partnerships, or concentrated clinical experiences at larger medical centers. These alternatives may not completely reproduce operating room opportunities, but they can broaden exposure beyond routine agency training.

Medical Director Involvement

A continuous competency system requires more than nominal medical director approval. Medical directors should help define standards, interpret clinical findings, review significant cases, support remediation, and facilitate hospital relationships (Vithalani et al., 2022).

The degree of involvement must be realistic. Some medical directors oversee multiple agencies and have limited compensated time. The organization should identify which functions specifically require physician participation and which can be managed by educators, quality improvement personnel, or trained reviewers under established policies.

Regular, structured reporting can make physician involvement more efficient. Rather than sending isolated questions or large volumes of unorganized data, the agency can provide concise summaries of significant cases, emerging trends, unresolved clinical concerns, and recommended actions.

If the existing medical oversight arrangement cannot support these responsibilities, leadership must address the gap. A competency system should not be designed around physician participation that is unavailable in practice.

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Union and Labor Considerations

Union representatives and labor groups should be engaged early when implementation affects schedules, compensation, evaluations, work rules, personnel records, or disciplinary processes. Introducing a competency-tracking system without consultation may create legitimate concerns about surveillance, fairness, and the use of performance information (Meadley et al., 2023; Murray et al., 2024).

Leaders should explain the system's purpose, the data that will be collected, who will have access, how records will be used, and how coaching will be distinguished from discipline. Employees should understand whether activities are mandatory, when they will occur, and how missed participation will be addressed.

Collective bargaining agreements may affect overtime, backfill, schedule changes, instructor assignments, clinical rotations, or remediation. These requirements should be identified before the pilot begins. Early collaboration can improve the design and help prevent avoidable disputes.

Labor involvement should not be viewed only as an obstacle. Frontline representatives can identify scheduling burdens, privacy concerns, and unintended consequences that leadership may overlook. Their participation can strengthen fairness, credibility, and workforce acceptance (Adelgais et al., 2019; Liu et al., 2021).

Rural and Volunteer Agency Limitations

Rural, frontier, and volunteer EMS organizations may face limited staffing, long travel distances, low call volume, restricted hospital access, small budgets, and limited instructor availability.

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These conditions increase the risk of skill decay while making conventional competency programs more difficult to operate (Dyson et al., 2017; Risavi et al., 2023; Thomas et al., 2024).

The framework should be adapted rather than abandoned. Rural agencies may rely more heavily on brief local simulation, mobile training resources, regional instructors, remote case review, shared equipment, and periodic concentrated training. Several agencies may collaborate through a county, regional EMS authority, hospital system, community college, or medical direction program.

Clinical experiences may require travel to a regional medical center or cadaver laboratory. When travel is necessary, agencies may schedule longer but less frequent experiences and combine them with other educational activities. Grant funding may support travel, lodging, overtime, backfill, equipment, or regional coordination.

Volunteer agencies should avoid creating requirements that make participation practically impossible. Training frequency and documentation expectations should reflect workforce availability while preserving meaningful standards. A smaller, reliable system is more valuable than an ambitious model that volunteers cannot consistently complete.

Data Collection and Privacy

Performance tracking requires data, but data collection creates administrative, technical, and ethical responsibilities (Alhur, 2024; Pascale et al., 2022; Scheibner et al., 2022). Agencies should determine what information is necessary, where it will come from, who will enter it, how it will be verified, and who may access it.

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Measures should be limited to information that supports clinical or organizational decisions. Collecting excessive data increases workload, reduces completion, and creates additional privacy risk. Definitions should be standardized so that measures such as an attempt, first-pass success, complication, clinical exposure, or completed case review are recorded consistently.

Clinical information must be protected according to applicable privacy laws, agency policies, employment requirements, and agreements with partner organizations. Access to identifiable patient and provider information should be restricted to personnel with a legitimate role in review, education, medical oversight, or administration (Pascale et al., 2022; Scheibner et al., 2022).

Agencies should also define how long records will be retained and whether competency data become part of the formal employment or credentialing record. These decisions may require legal, human resources, labor, compliance, or privacy review.

A competency dashboard should not become a public ranking system. Individual information should be used carefully and interpreted in context. Aggregate reporting is generally more appropriate for executive and organizational review, while identifiable information should be limited to individual development, authorized clinical oversight, and circumstances requiring formal action.

Resistance to Change

Resistance should be expected, particularly if clinicians believe the system questions their professional ability, increases workload, or creates another method of surveillance (Adelgais et

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al., 2019; Lee et al., 2025; Meadley et al., 2023). Supervisors and instructors may also resist if new responsibilities are added without time, preparation, or support.

Communication should begin before implementation. Personnel need to understand why the system is necessary, what problem it is intended to solve, and how it will support rather than merely evaluate them. Leaders should acknowledge the real burdens involved instead of presenting the initiative as effortless.

Frontline clinicians should have opportunities to influence scenario design, scheduling, documentation, and workflow. Their participation does not mean that every requirement becomes optional. It does help ensure that the system reflects operational reality and allows preventable problems to be corrected early.

Early implementation should produce visible value. Clinicians are more likely to support the system when practice is relevant, feedback is useful, equipment problems are corrected, and leadership responds to reported concerns. They are less likely to support it when activities are repetitive, data disappear into reports, or identified system problems remain unresolved.

Preventing Review From Becoming Punitive

A competency system will fail if clinicians believe that honest participation creates unreasonable disciplinary risk. Providers may underreport exposure, avoid discussing uncertainty, or treat simulation as a performance to be survived rather than an opportunity to improve.

The organization should establish a clear distinction between developmental review and formal discipline. Most performance gaps should be addressed through feedback, coaching, focused

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practice, and reassessment. Formal action may be appropriate for serious misconduct, dishonesty, reckless behavior, deliberate violations, or repeated refusal to engage in required improvement.

This distinction should be stated in policy and demonstrated through leadership behavior. Labeling a process “nonpunitive” has little value if routine mistakes consistently result in public criticism, humiliation, or disproportionate consequences.

Reviewers should examine system conditions as well as individual actions (Meadley et al., 2023; Murray et al., 2024; Weick & Sutcliffe, 2015). Equipment configuration, staffing, communication, protocol design, scene conditions, supervision, and prior training may all affect performance. Accountability remains important, but it should be informed by the circumstances in which care occurred.

Confidentiality should also be protected. Lessons can be shared through deidentified cases and aggregate findings without unnecessarily exposing individual clinicians. Psychological safety grows when personnel see that review produces learning, support, and system correction (Murray et al., 2024; Rotteau et al., 2022).

Maintaining the System After Launch

Initial enthusiasm is not the same as sustainability. Programs often begin with strong leadership attention, external funding, new equipment, and high participation, then weaken as champions leave, workloads increase, or priorities change (Adelgais et al., 2019; Rotteau et al., 2022).

Sustainability should be designed from the beginning. Responsibilities should be embedded in job functions and policies rather than residing with a single enthusiastic individual (Murray et al.,

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2024; Rotteau et al., 2022). Training, case review, reporting, and evaluation should be placed on recurring schedules. Necessary expenses should be incorporated into routine budgeting.

Leadership should monitor whether core activities continue to occur. Relevant questions include:

- Are brief practice sessions occurring consistently?
- Are advanced airway cases being reviewed?
- Is feedback timely?
- Are exposure gaps being identified?
- Are clinical partnerships still active?
- Are remediation plans completed?
- Are findings influencing training and organizational decisions?
- Are clinicians continuing to view the process as useful and fair?

The agency should periodically simplify the system. Documentation that no longer informs decisions should be removed. Training should change as performance needs change. Measures should be reviewed for reliability and usefulness. Partnerships should be evaluated according to the quality of experience they provide.

Succession planning is also necessary. More than one person should understand essential workflows, data systems, partnership arrangements, and reporting responsibilities. A system that depends entirely on one chief, educator, medical director, or quality improvement coordinator is vulnerable when that individual leaves (Murray et al., 2024; Weick & Sutcliffe, 2015).

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Starting at a Sustainable Scale

Continuous competency requires resources. Agencies should be candid about that reality. Protected time, educator capacity, clinical oversight, data management, equipment, and partnership development cannot be sustained through good intentions alone.

At the same time, limited resources do not require an agency to postpone all action. Implementation can begin incrementally with one high-priority procedure, a small provider group, brief shift-based practice, a standardized case-review process, and a limited set of meaningful measures. The initial objective is to establish a reliable cycle, demonstrate value, and learn what the organization needs before expanding (Adelgais et al., 2019; Liu et al., 2021; von Vopelius-Feldt et al., 2023).

A modest system that operates consistently is more useful than an elaborate program that cannot be maintained. The correct starting point will differ across agencies, but the governing principle remains the same: begin at a scale the organization can support, evaluate honestly, and expand only when the foundation is strong enough to sustain the next phase.

Funding and Resource Strategies

Funding is one of the most significant barriers to implementing a continuous competency system. EMS agencies may recognize the need for more frequent simulation, clinical exposure, performance tracking, and case review while lacking sufficient discretionary funding to support equipment, overtime, backfill, instructors, data systems, or hospital partnerships. This challenge

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is particularly acute for smaller, rural, volunteer, and publicly funded agencies operating under restrictive budgets (Basnawi, 2024; Eaton, 2023; Powell et al., 2025).

The cost question should not be minimized. Continuous competency requires resources, and some costs will recur after implementation. However, agencies should not assume that the entire system must be financed through the existing training budget or funded in a single budget cycle. A combination of workforce-development funding, public-safety grants, healthcare partnerships, academic collaboration, regional cost sharing, and phased budgeting may make implementation possible (Adelgais et al., 2019; Bobel et al., 2025).

The appropriate funding strategy will depend on agency structure, eligibility, geography, project scope, and local partnerships. Before pursuing a specific source, an agency should define the problem it intends to address, establish baseline needs, identify the population that will benefit, and determine which project costs are one-time investments and which will require continuing support.

Workforce-Development Funding

A continuous competency system is not solely a clinical training initiative. It is also a workforce-development strategy. It strengthens the capabilities of the existing workforce, supports career-long development, improves professional confidence, and helps clinicians adapt to changing technology, protocols, and patient-care expectations (Eaton, 2023; Turan & Pekmezci, 2026; Weber et al., 2024).

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Framing the initiative in workforce-development terms may create access to funding outside traditional EMS training budgets. Potential sources may include state and local workforce agencies, regional workforce-development boards, healthcare workforce initiatives, community college programs, rural workforce grants, and programs intended to strengthen essential public-service occupations.

A strong workforce-development proposal should explain how the program will:

- Preserve critical clinical skills among practicing personnel.
- Provide structured professional development.
- Improve access to modern simulation and clinical education.
- Strengthen recruitment and retention.
- Reduce disparities between large and small agencies.
- Create transferable instructional or clinical competencies.
- Build regional healthcare capacity.

Agencies should avoid framing the proposal as a one-time purchase of training equipment. The broader value is clearer when equipment is presented as one component of a defined workforce system that includes instruction, clinical exposure, measurement, and evaluation (Bienstock et al., 2022; Vithalani et al., 2022).

Simulation and Equipment Grants

Simulation equipment may represent one of the largest initial costs. Depending on the program's scope, an agency may need airway trainers, high-fidelity mannequins, video laryngoscopes, suction equipment, capnography, procedure trainers, audiovisual systems, replacement supplies, or mobile training packs.

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Equipment grants may be available through public-safety, emergency preparedness, healthcare education, rural health, foundation, or regional improvement programs. Manufacturers or healthcare foundations may also support equipment acquisition, although agencies should preserve clinical independence and comply with applicable procurement and conflict-of-interest requirements.

Grant applications should connect equipment to a specific operational plan. A request is stronger when it explains:

- Which competency gap the equipment will address.
- How often it will be used.
- Which clinicians and agencies will have access.
- Who will provide instruction.
- How performance will be measured.
- How supplies and maintenance will be funded.
- How the equipment will support regional or long-term capacity.

A sophisticated simulator is not automatically the best investment. For frequent micro-simulation, durable task trainers, standardized equipment, and well-designed scenarios may provide greater practical value than a high-cost system that is difficult to schedule, operate, or maintain. Equipment decisions should follow the competency strategy rather than define it (Mankute et al., 2022; Wheeler & Dippenaar, 2020).

Federal, State, and Regional Public-Safety Grants

Federal, state, county, and regional grant programs may support portions of a continuous competency initiative. Eligible activities may include training, equipment, workforce

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development, preparedness, quality improvement, interoperability, rural capacity, or regional collaboration.

Potential avenues may include fire and EMS assistance programs, emergency preparedness funding, rural health initiatives, state EMS grants, trauma-system funding, county public-safety allocations, and regional healthcare coalition programs. Eligibility and allowable costs vary substantially. Some programs fund equipment but restrict overtime; others support workforce activities but not durable equipment. Agencies must review current requirements carefully before building a proposal around a particular source.

The strongest grant narratives connect competency maintenance with broader public priorities:

- Patient safety.
- Emergency preparedness.
- Workforce resilience.
- Standardization of care.
- Reduction of preventable complications.
- Rural access.
- Regional mutual-aid capability.
- Data-driven quality improvement.
- Readiness for rare but high-consequence events.

Regional proposals may be especially competitive when they demonstrate that multiple agencies will share training resources, instructors, data processes, or clinical partnerships. A shared project can reduce duplication and extend benefits beyond a single organization (Adelgais et al., 2019; Bobel et al., 2025).

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Grant funding should be treated as a catalyst rather than a complete sustainability plan, because implementation durability depends on continuing organizational capacity and leadership support (Rotteau et al., 2022; Weick & Sutcliffe, 2015). Agencies should identify how personnel, supplies, maintenance, data management, and recurring training will continue after the grant period ends.

Hospital Community-Benefit Partnerships

Hospitals and health systems may have a direct interest in strengthening prehospital clinical readiness. EMS performance affects patients before arrival and influences emergency department care, trauma outcomes, cardiac arrest management, airway complications, and continuity across the healthcare system (Carney et al., 2021; Redlener et al., 2024; Wang, 2023).

Nonprofit hospitals may support activities that align with identified community health needs, emergency preparedness, injury prevention, rural access, or regional healthcare capacity. Although eligibility and community-benefit requirements vary, EMS competency initiatives may warrant discussion when they address documented patient-safety or community-readiness needs.

Hospital participation may include:

- Financial support.
- Access to simulation centers.
- Operating room or clinical rotations.
- Anesthesia or physician instruction.
- Data collaboration.
- Shared quality improvement.
- Equipment or facility access.

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- Joint grant applications.
- Administrative support for clinical agreements.

The partnership should be framed as a shared patient-care initiative, not merely an EMS request for training access (Bobel et al., 2025; Trimmel et al., 2017). Agencies should explain how improved prehospital readiness can reduce complications, strengthen care transitions, and support the hospital's community and regional responsibilities.

Hospital relationships require clear governance. Agreements should address supervision, consent, privacy, credentialing, liability, data use, scheduling, and evaluation. Financial support should not compromise medical oversight, procurement integrity, or objective performance review.

Academic and Research Partnerships

Universities, community colleges, medical schools, nursing programs, public-health departments, and simulation centers may provide expertise and resources that EMS agencies cannot maintain independently (Cavanagh et al., 2023; Cimino & Braun, 2023).

Academic partners may assist with:

- Program design.
- Simulation development.
- Instructor preparation.
- Access to laboratories or simulation facilities.
- Data analysis.
- Evaluation design.
- Research methodology.
- Student or faculty participation.

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- Grant development.
- Publication and dissemination of findings.

A partnership can be mutually beneficial. EMS agencies gain access to educational and analytical capacity, while academic institutions gain opportunities for applied research, student learning, community engagement, and evaluation of clinical workforce interventions.

Research partnerships may be especially valuable during pilot implementation. Independent or collaborative evaluation can help determine whether the model is feasible, whether participation improves, and whether clinical or organizational outcomes change (Liu et al., 2021; von Vopelius-Feldt et al., 2023). Findings may strengthen future funding proposals and support broader adoption.

The agency should define ownership, confidentiality, publication rights, data access, intellectual property, and research oversight before the partnership begins. Projects involving systematic research or dissemination may require institutional review and additional patient or provider protections.

Shared Regional Training Systems

Not every agency needs to build a complete competency infrastructure independently. Regional collaboration can distribute costs and expand access to instructors, simulation equipment, facilities, clinical partners, and data expertise (Adelgais et al., 2019; Bobel et al., 2025).

A regional system might include:

- A shared simulation center.
- Mobile training equipment.

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- A regional clinical coordinator.
- Joint hospital or anesthesia agreements.
- Shared cadaver laboratory access.
- Common competency standards.
- Instructor-development programs.
- Regional case-review conferences.
- Data aggregation and benchmarking.
- Joint purchasing and grant applications.

This approach may be particularly valuable for rural, volunteer, or low-volume agencies. A single organization may not have enough clinicians, cases, or financial capacity to support a dedicated program, but several agencies may be able to sustain one collectively (Basnawi, 2024; Thomas et al., 2024).

Regional collaboration also introduces challenges. Participating agencies may have different protocols, medical directors, labor agreements, documentation systems, and organizational cultures. Governance must define ownership, costs, access, scheduling, standards, data use, liability, and decision-making authority.

The model does not need to be identical across every agency. Shared infrastructure can support local implementation while allowing medical directors and leaders to preserve appropriate clinical and operational differences.

Phased Budgeting

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A continuous competency system should not be viewed as a single purchase. It includes start-up costs, implementation costs, and recurring operating costs. Separating these categories helps leaders understand what must be funded immediately and what can be introduced over time.

Initial assessment and design costs may include staff planning time, consultation, baseline data analysis, policy development, and partnership negotiation.

Pilot costs may include limited simulation equipment, supplies, instructor preparation, overtime, backfill, data tools, and evaluation.

Expansion costs may include additional equipment, broader instructor capacity, more clinical rotations, software or dashboard development, regional coordination, and increased quality improvement support.

Recurring costs may include replacement supplies, equipment maintenance, personnel time, ongoing clinical experiences, data management, training updates, and periodic evaluation.

Phased budgeting allows the agency to begin with a defined clinical priority and a manageable provider group. Resources can be expanded after the pilot demonstrates feasibility and identifies the system's actual requirements. This reduces the risk of purchasing equipment or building infrastructure that does not fit operational needs (Adelgais et al., 2019; Liu et al., 2021).

Agencies should also distinguish essential components from enhancements. Standardized equipment, protected practice, case review, feedback, and basic performance tracking may form the minimum viable system. High-fidelity simulation, specialized software, expanded clinical rotations, or advanced analytics can be added as resources permit.

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Demonstrating Organizational Return

Continuous competency should be evaluated as an investment in clinical reliability, workforce capability, and organizational risk management (Murray et al., 2024; Vithalani et al., 2022; Weick & Sutcliffe, 2015). Demonstrating return does not require claiming that every adverse event or liability cost can be eliminated. It requires showing how the system creates measurable value.

Potential areas of return include:

Risk reduction: More consistent preparation, earlier identification of performance gaps, improved equipment familiarity, and structured case review may reduce the likelihood of preventable clinical complications.

Workforce development: Regular practice, coaching, and clinical exposure strengthen professional capability and may improve clinician confidence, engagement, and perceptions of organizational support.

Quality improvement: Integrated data allow agencies to identify trends, target training, evaluate interventions, and demonstrate that clinical oversight extends beyond minimum compliance (Makrides et al., 2023; Vithalani et al., 2022; von Vopelius-Feldt et al., 2023).

Operational standardization: Consistent equipment layouts, defined procedures, common performance standards, and clear responsibilities may reduce variation and unnecessary cognitive burden (Paas & van Merriënboer, 2020; Zaphir et al., 2024).

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Funding readiness: Agencies with documented baseline needs, measurable objectives, implementation plans, and evaluation processes are better positioned to compete for grants and partnership support.

Organizational credibility: A structured competency system demonstrates commitment to patient safety, clinical governance, and evidence-informed management. This may strengthen relationships with medical directors, hospitals, regulators, governing boards, insurers, and community partners.

Leaders should establish measures before implementation so that changes can be compared with baseline performance (Makrides et al., 2023; Vithalani et al., 2022; von Vopelius-Feldt et al., 2023). Useful indicators may include training participation, clinical exposure, case-review completion, time to feedback, performance trends, complication rates, remediation outcomes, and workforce perceptions.

Financial return may be difficult to isolate during a small pilot, particularly when adverse events are uncommon. The agency should therefore evaluate both economic and nonfinancial value (Wilkinson-Stokes et al., 2024). Improved readiness, stronger oversight, earlier risk detection, and increased workforce capability are meaningful organizational outcomes even when they cannot be reduced immediately to a dollar amount.

Building a Sustainable Funding Strategy

No single funding source is likely to support every component indefinitely. A sustainable strategy may combine grant funding for start-up expenses, hospital or academic partnerships for clinical

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and educational resources, regional collaboration for shared infrastructure, and agency budgeting for recurring operations (Adelgais et al., 2019; Bobel et al., 2025; Rotteau et al., 2022).

The funding plan should answer four questions:

1. What is required to begin?
2. What is required to complete and evaluate the pilot?
3. What will broader implementation cost?
4. Which recurring expenses must eventually become part of normal operations?

Funding should follow a clearly defined implementation model. Agencies should first assess their competency gaps, select priorities, and determine what resources are necessary. Seeking funds before defining the system can result in equipment purchases or isolated training activities that do not produce sustainable readiness (Adelgais et al., 2019; Rotteau et al., 2022).

White Paper No. 4 of the Sentinel White Paper Series will examine funding strategy in greater depth, including project development, grant readiness, partnership structures, budgeting, and sustainability. For the present framework, the central conclusion is that financial constraints are real but do not require an all-or-nothing decision. Agencies can combine multiple funding avenues, begin at a manageable scale, demonstrate value, and expand as resources and evidence develop.

Measuring Success

A continuous competency system should be evaluated according to whether it is implemented reliably, improves clinical performance, and becomes embedded within the organization.

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Measuring only procedural outcomes provides an incomplete picture. A program may fail to improve because its design is ineffective, but it may also fail because clinicians did not participate, cases were not reviewed, feedback was delayed, or leadership did not provide the necessary support. (Liu et al., 2021; Vithalani et al., 2022)

Measurement should therefore distinguish among three categories: **implementation measures, performance measures, and organizational measures**. Together, they answer three different questions:

1. Is the system operating as intended?
2. Is clinical performance improving?
3. Can the organization sustain and expand the system?

Measures should be defined before implementation and compared with baseline data whenever possible. Agencies should use a manageable set of indicators that support decisions rather than collecting large amounts of information that personnel cannot reliably maintain or interpret. (Makrides et al., 2023; Redlener et al., 2024)

Implementation Measures

Implementation measures evaluate whether the core activities of the competency system are occurring consistently. These measures often provide the earliest evidence of progress because they can be assessed before the organization has accumulated enough clinical cases to evaluate patient outcomes.

Training Participation

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Training participation measures the percentage of eligible clinicians who complete required practice, simulation, assessment, coaching, or educational activities. Participation should be examined across stations, shifts, employment categories, and provider groups to identify inconsistent access or adoption.

Attendance alone does not establish meaningful participation. Records should distinguish between presence and completion of the intended competency activity. Leaders should also examine why activities are missed. Low participation may reflect clinician disengagement, but it may also result from call volume, staffing shortages, scheduling problems, inadequate supervisory support, or unavailable equipment.

Simulation Frequency

Simulation frequency measures how often clinicians practice the targeted procedure and whether practice occurs at the intervals established by the program. This may include brief shift-based touchpoints, focused skill stations, complex scenarios, and formal reassessments.

The measure should distinguish frequency from intensity. Several brief exercises may support equipment familiarity and procedural sequencing, while less frequent high-fidelity scenarios may evaluate integrated decision-making and team performance. Both have value, but they serve different purposes.

Agencies should also monitor whether simulation responds to actual performance findings. A program may meet its frequency target while repeatedly delivering the same exercise regardless

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of field data or clinician needs. Meaningful implementation requires both regular practice and relevant content. (Nielsen et al., 2021; Wheeler & Dippenaar, 2020)

Clinical Exposure Hours

Clinical exposure measures should document time spent in approved clinical settings and the nature of participation. Hours alone can be misleading because one clinician may actively participate in several airway assessments and procedures, while another may receive limited relevant experience during an equally long rotation.

Records should therefore include:

- Clinical setting.
- Duration.
- Procedures observed, assisted with, or performed.
- Type of supervision.
- Feedback received.
- Competency areas addressed.

Field exposure should also be tracked. Monitoring time since the clinician's last clinical procedure can identify prolonged exposure gaps and support targeted simulation or rotation scheduling. (Thomas et al., 2024)

Percentage of Airway Cases Reviewed

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The percentage of eligible airway cases reviewed indicates whether quality assurance is operating consistently. The numerator should include completed reviews, while the denominator should include all cases meeting the agency's defined review criteria.

A continuous competency system should generally review all advanced airway cases rather than only unsuccessful procedures or complications. This includes endotracheal intubation, supraglottic airway placement, alternative airway decisions, failed attempts, and clinically significant airway-management events.

The organization should define what constitutes a completed review. Locating the case or checking a documentation field is not sufficient. A meaningful review should examine clinical decisions, technical performance, complications, protocol adherence, and opportunities for individual or organizational learning. (Vithalani et al., 2022)

Time From Case to Feedback

Feedback loses value when it is significantly delayed. Time from clinical event to feedback measures how quickly findings reach the clinician and whether review processes are sufficiently responsive. (Vithalani et al., 2022)

Agencies may establish different timelines for different levels of review. A brief operational debrief may occur shortly after the call. A formal review may require access to hospital outcomes, monitor data, or medical director input and therefore take longer. Both should have defined expectations.

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Long delays may indicate unclear responsibility, insufficient reviewer capacity, inaccessible data, or administrative burden. Tracking this measure helps leaders identify where the review process has stalled.

Completion of Remediation

When a performance gap is identified, the agency should track whether an improvement plan was initiated, completed, and reevaluated. Completion should not mean that a clinician merely attended an assigned activity. It should indicate that the clinician received targeted support and subsequently demonstrated the required performance.

Relevant measures may include:

- Time from identified gap to initiation of coaching.
- Completion of assigned practice or education.
- Reassessment results.
- Medical director review where necessary.
- Recurrence of the same concern.
- Continued performance after remediation.

The purpose is to determine whether identified gaps lead to effective action rather than remaining documented but unresolved.

Staff Engagement

Staff engagement reflects whether clinicians and supervisors view the competency system as relevant, fair, and useful. It can be evaluated through surveys, interviews, focus groups, participation patterns, suggestions, voluntary practice, and willingness to report concerns.

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Relevant questions may examine whether personnel believe:

- Training reflects actual field needs.
- Feedback is useful and respectful.
- Standards are applied consistently.
- Leaders support participation.
- Reporting concerns is safe.
- The system improves readiness.
- Time and workload expectations are reasonable.

Engagement should not be equated with universal enthusiasm. A clinically necessary program may still require mandatory participation. However, persistent distrust or disengagement may indicate weaknesses that threaten implementation and data reliability. (Murray et al., 2024; Rotteau et al., 2022)

Performance Measures

Performance measures evaluate whether the competency system strengthens clinical execution, decision-making, and patient safety. These measures should be interpreted within the context of case volume, patient condition, procedural difficulty, and provider exposure. (Gage et al., 2024; Jarvis et al., 2023)

First-Pass Success Without Complications

First-pass success is an important measure because repeated airway attempts can increase procedural difficulty and patient risk. However, successful tube placement alone does not establish high-quality performance. (Jarvis et al., 2023)

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First-pass success without complications provides a more clinically meaningful measure. Depending on available data and agency definitions, complications may include significant hypoxia, hypotension, aspiration, esophageal placement, airway trauma, bradycardia, cardiac arrest, or other adverse physiological events occurring during airway management.

Definitions should be established in advance and applied consistently. Agencies should avoid comparing results across systems unless definitions, patient populations, and documentation practices are sufficiently similar.

Overall Airway Success

Overall airway success evaluates whether the clinician or team ultimately established and maintained effective oxygenation and ventilation using an appropriate method. This may include successful endotracheal intubation, supraglottic airway placement, bag-mask ventilation, or another clinically suitable strategy.

This measure prevents the system from defining success solely as placement of an endotracheal tube. The purpose of airway management is effective patient care, not completion of a particular procedure. An appropriate decision to abandon a difficult intubation and establish effective ventilation with another device may represent strong clinical performance. (Carney et al., 2021; Jarvis et al., 2023)

Overall success should therefore consider device placement, confirmation, maintenance, physiological response, and transition to hospital care.

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Appropriate Device Selection

Device selection should reflect the patient's condition, airway anatomy, clinical environment, available personnel, provider capability, and established protocols. Measuring appropriate selection requires clinical review rather than simple database calculation.

The review should consider whether the selected intervention was reasonable at the time the decision was made. It should avoid judging decisions solely through hindsight. In some cases, the most appropriate action may be endotracheal intubation. In others, supraglottic airway placement, bag-mask ventilation, or continued noninvasive management may provide the safest approach.

This measure reinforces that airway competency includes knowing when and how to use different strategies, not merely possessing a specific technical skill.

Decision Quality

Decision quality evaluates the clinician's reasoning throughout the case. It may include:

- Recognition of the need for airway intervention.
- Assessment of procedural difficulty.
- Selection of medications and equipment.
- Preparation of primary and backup plans.
- Management of oxygenation.
- Recognition of failed attempts.
- Timely transition to an alternative strategy.
- Post-placement confirmation and monitoring.
- Adaptation to changing patient conditions.

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Decision quality is more difficult to quantify than procedural success. Agencies may use structured review criteria, rating scales, medical director evaluation, or multidisciplinary case discussion. Reviewers should receive guidance to improve consistency and reduce subjective judgment. (Kunkes et al., 2022)

Reduction in Adverse Airway Events

The organization should monitor clinically important adverse events over time. These may include:

- Severe or prolonged hypoxia.
- Aspiration.
- Unrecognized esophageal placement.
- Dislodgement.
- Airway trauma.
- Delayed ventilation.
- Excessive procedural attempts.
- Failure to recognize deterioration.
- Other locally defined complications.

Changes should be interpreted cautiously, particularly in small agencies with few airway cases. A short period without adverse events does not prove that the system is effective, and one complex case does not necessarily indicate failure. Trends should be examined over an appropriate period and combined with case review. (Vithalani et al., 2022)

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Reporting may initially increase after implementation because documentation and psychological safety improve. This can be a sign of a stronger learning system rather than worsening care. Leaders should distinguish between increased event occurrence and increased visibility.

Maintenance of Competency Over Time

The central objective is not simply immediate improvement after training. It is sustained readiness. Agencies should therefore evaluate performance at repeated intervals and examine whether clinicians maintain technical ability, decision quality, and equipment familiarity. (Legoux et al., 2020)

Measures may include:

- Performance during periodic simulation.
- Time since last procedure.
- Retention following training or remediation.
- Consistency across increasingly difficult scenarios.
- Field performance following prolonged exposure gaps.
- Need for repeated remediation.
- Changes in performance across months or years.

Maintenance should be evaluated at both individual and workforce levels. A program may improve average performance while leaving a subgroup of clinicians with persistent exposure gaps. Continuous tracking allows the agency to identify those differences and respond before readiness declines further. (Legoux et al., 2020; Thomas et al., 2024)

Organizational Measures

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Organizational measures evaluate whether the conditions needed to sustain competency are becoming part of routine governance and operations. Clinical performance cannot improve reliably if the supporting system remains fragile or dependent on a few individuals (Murray et al., 2024; Weick & Sutcliffe, 2015).

Leadership Participation

Leadership participation may be demonstrated through:

- Approval and communication of competency priorities.
- Assignment of responsibility.
- Protected training time.
- Resource allocation.
- Review of performance reports.
- Response to identified risks.
- Participation in partnership development.
- Inclusion of competency goals in strategic and operational planning.

Leadership support should be measured through actions rather than statements. A policy describing competency as a priority has limited value if training is repeatedly cancelled, equipment problems remain unresolved, or performance findings receive no executive response (Rotteau et al., 2022; Weick & Sutcliffe, 2015).

Quality Assurance Consistency

Quality assurance consistency examines whether review processes operate reliably across time, locations, shifts, and clinicians. Relevant indicators may include:

- Percentage of qualifying cases identified.

- Percentage reviewed.
- Review timeliness.
- Completeness of documentation.
- Consistency of review criteria.
- Feedback completion.
- Tracking of recommended actions.
- Medical director involvement.
- Closure of identified concerns.

Variation should be examined carefully. If one station or reviewer consistently completes timely reviews while another does not, the agency should identify differences in workload, training, data access, or supervisory expectations (Vithalani et al., 2022).

Hospital Partnership Activity

The existence of a signed agreement does not establish an active partnership. Agencies should measure whether the relationship produces meaningful clinical and educational activity.

Measures may include:

- Number of available rotation opportunities.
- Clinician participation.
- Procedures observed, assisted with, or performed.
- Feedback from clinical preceptors.
- Cancellation rates.
- Joint training or case-review activities.
- Partner satisfaction.
- Continuation or expansion of the agreement.

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Quality should be considered alongside volume. A smaller number of well-supervised experiences may provide greater value than numerous passive observation hours.

Psychological Safety

A continuous competency system depends on clinicians' willingness to acknowledge uncertainty, discuss mistakes, request assistance, and report equipment or system concerns. Staff perceptions of psychological safety should therefore be evaluated periodically (Murray et al., 2024; Rotteau et al., 2022).

Surveys, interviews, focus groups, reporting patterns, and participation in debriefings can help determine whether clinicians believe they can speak honestly without humiliation or disproportionate punishment.

Possible indicators include whether staff feel comfortable:

- Admitting that a skill has become unfamiliar.
- Reporting an unsuccessful attempt.
- Questioning an established practice.
- Requesting additional training.
- Raising an equipment or protocol concern.
- Participating honestly in case review.
- Providing feedback to supervisors or leaders.

Psychological safety does not eliminate performance standards or accountability. It allows concerns to become visible early enough for the organization to address them responsibly.

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Sustainability and Scalability

Sustainability evaluates whether the competency system can continue after its initial launch, pilot funding, or leadership attention ends. Relevant indicators may include: (Rotteau et al., 2022)

- Recurring budget support.
- Stable instructor and reviewer capacity.
- Integration into policies and job responsibilities.
- Continued training participation.
- Reliable data collection.
- Active clinical partnerships.
- Leadership review.
- Succession planning.
- Manageable administrative burden.

Scalability examines whether the system can expand to additional stations, clinicians, agencies, or procedures without losing consistency or overwhelming available resources. Before expansion, leaders should determine whether the existing model is functioning reliably and whether additional staffing, equipment, funding, or governance will be required.

Expansion should not be treated as success by itself. A small system that operates consistently is more valuable than a large program with unreliable participation, incomplete reviews, and unsustainable costs.

Interpreting Measures Together

No single measure can establish whether a continuous competency system is successful. High training participation does not prove that clinical performance improved. Strong procedural

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outcomes do not establish that the system is sustainable. Increased reporting of adverse events does not necessarily indicate worsening care. Each result must be interpreted alongside implementation conditions and organizational context (Liu et al., 2021; Makrides et al., 2023).

For example:

- If performance does not improve but participation is low, the priority may be implementation rather than redesigning the clinical intervention.
- If simulation performance improves but field complications do not, the agency should examine whether training transfers adequately to clinical conditions.
- If case-review rates increase but time to feedback remains long, reviewer capacity or workflow may need attention.
- If reporting increases while staff perceptions of psychological safety improve, the organization may be identifying problems that previously remained hidden.
- If outcomes improve but the system depends on temporary funding or one individual, sustainability remains unresolved.

A balanced measurement framework helps leaders understand not only whether results changed, but why they changed and what should happen next.

From Measurement to Improvement

Measures should lead to decisions. Reports should identify performance trends, implementation barriers, unresolved risks, and recommended actions. Leadership, medical direction, education, operations, and quality improvement personnel should review findings at established intervals and assign responsibility for follow-up. (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023)

The organization should use results to refine simulation, strengthen clinical partnerships, adjust policies, correct equipment problems, improve case review, allocate resources, and target

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individual development. Subsequent measurement should determine whether those actions produced the intended improvement.

Success is not demonstrated by the existence of a training calendar, a dashboard, or a clinical partnership. It is demonstrated when the system operates consistently, clinicians maintain readiness, patient care becomes more reliable, and the organization can identify and correct weaknesses before they result in preventable harm. (Weick & Sutcliffe, 2015)

Extending the System Beyond Airway Management

Airway management provides a clear example of the difficulties associated with maintaining high-acuity, low-frequency skills. It combines technical execution, clinical judgment, equipment familiarity, team coordination, and decision-making under severe time pressure. However, the underlying competency problem is not unique to endotracheal intubation. EMS clinicians are expected to perform numerous complex interventions that may occur only rarely during an individual provider's career. (Bienstock et al., 2022; Weber et al., 2024)

The continuous competency system is therefore designed as a broader clinical-readiness model rather than an airway-specific training program. Its core components remain applicable across procedures: (Weber et al., 2024; Weick & Sutcliffe, 2015)

- Defined competency standards.
- Baseline assessment.
- Brief, recurring practice.
- Progressive simulation.
- Meaningful clinical or anatomical exposure.

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- Structured case review.
- Timely feedback and coaching.
- Performance tracking.
- Leadership support.
- Continuous quality improvement.

The precise combination of activities will vary by procedure. Some skills may benefit from frequent task-based repetition, while others require complex team simulation, specialty clinical partnerships, or intensive cognitive rehearsal. The governing principle remains consistent: the less frequently clinicians encounter a critical procedure, the more deliberately the organization must maintain readiness between events. (Bienstock et al., 2022; Legoux et al., 2020)

Intraosseous Access

Intraosseous access is often taught as a relatively straightforward procedure, but reliable performance requires correct site selection, landmark identification, device preparation, insertion technique, confirmation, securement, infusion management, and recognition of complications.

Competency may decline when clinicians rely primarily on familiar access sites or rarely perform the procedure in adults, children, or patients with difficult anatomy. Changes in devices can create further variability if personnel receive initial instruction but little subsequent practice. (Weber et al., 2024)

A continuous system could include brief equipment checks, practice using multiple anatomical sites, pediatric and adult scenarios, recognition of incorrect placement, troubleshooting poor flow, and review of every field insertion. Performance tracking could examine indication, site

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selection, insertion success, number of attempts, confirmation, complications, and time to vascular access. (Bienstock et al., 2022)

Needle or Finger Thoracostomy

Decompression of tension pneumothorax is a high-risk intervention performed under significant time pressure. It requires clinicians to recognize a rapidly deteriorating condition, distinguish it from other causes of instability, select the appropriate procedure and anatomical site, use the correct equipment, and evaluate whether the intervention was effective.

Because the procedure occurs infrequently, clinicians may have limited opportunity to translate classroom instruction into operational proficiency. Anatomical variation, body habitus, environmental constraints, and evolving protocols further increase complexity. (Bienstock et al., 2022)

Continuous competency activities could combine anatomical review, task trainers, cadaver laboratory experience, progressive trauma scenarios, equipment standardization, and structured case review. Measurement should extend beyond successful insertion to include appropriate indication, anatomical site, catheter or instrument selection, recognition of treatment failure, complications, and patient response. (Bienstock et al., 2022)

Cricothyrotomy

Cricothyrotomy represents one of the clearest examples of a high-acuity, extremely low-frequency procedure. It may be required when other airway strategies fail, yet many clinicians

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will never perform it on a living patient. When it is needed, there may be little time for consultation or delayed preparation. (Risavi et al., 2023)

Readiness therefore cannot depend on field exposure. It must be created primarily through deliberate simulation, anatomical training, cognitive rehearsal, equipment familiarity, and realistic failed-airway scenarios. Clinicians should practice recognizing when the procedure is indicated, locating anatomical landmarks, preparing the required equipment, performing the approved technique, confirming effectiveness, and managing post-procedure care. (Bienstock et al., 2022; Risavi et al., 2023)

Cadaver laboratories may provide particularly valuable anatomical exposure. However, even infrequent cadaver training should be reinforced through regular local practice. Competency tracking might include time since last simulation, performance under time pressure, correct procedural sequencing, complication recognition, and appropriate decision-making during a cannot-intubate, cannot-oxygenate emergency. (Risavi et al., 2023)

Complicated Childbirth

Most prehospital births occur without major complications, but clinicians must be prepared for rare emergencies such as shoulder dystocia, breech presentation, prolapsed umbilical cord, postpartum hemorrhage, maternal deterioration, and neonatal resuscitation. These events require technical interventions, rapid recognition, communication, emotional control, and coordination of care for both mother and infant. (Farrell et al., 2022)

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Annual review is unlikely to produce sustained readiness for such a wide range of uncommon situations. Continuous competency should use short cognitive exercises, equipment reviews, hands-on obstetric simulation, team-based scenarios, and structured debriefing. Scenarios should require clinicians to recognize complications, select appropriate maneuvers, assign roles, communicate with receiving facilities, and manage simultaneous maternal and neonatal priorities. (Farrell et al., 2022)

Partnerships with labor and delivery departments, obstetric educators, midwives, maternal-fetal medicine programs, or regional perinatal centers may strengthen training and case review. Measures could include recognition time, selection and sequencing of interventions, team communication, neonatal care, hemorrhage management, and adherence to transport or destination protocols. (Farrell et al., 2022)

Ventilator Management

Transport ventilators have expanded EMS and critical care transport capabilities, but safe use requires more than entering prescribed settings. Clinicians must understand ventilation modes, pressure and volume relationships, alarms, oxygenation, patient-ventilator interaction, airway resistance, compliance, and troubleshooting.

Many providers transport ventilated patients inconsistently, and the complexity of cases can vary considerably. Device differences and infrequent exposure may increase the risk of incorrect settings or delayed recognition of deterioration.

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A continuous competency model could include frequent ventilator setup, alarm identification, waveform or parameter interpretation, and troubleshooting exercises. Advanced scenarios could involve worsening hypoxia, disconnection, obstruction, pneumothorax, breath stacking, changing compliance, equipment failure, or the need for manual ventilation.

Hospital respiratory therapy departments, intensive care units, transport programs, and equipment specialists may provide valuable partnerships. Tracking should examine device familiarity, setup accuracy, alarm response, clinical decision-making, complications, and participation in ventilator-related patient care.

Management of Central-Line Infusions

Interfacility and critical care transports may involve medications delivered through central venous access, including vasoactive agents, sedatives, antiarrhythmics, anticoagulants, electrolytes, and other high-risk infusions. These transports require accurate identification of medications, lines, concentrations, compatibility, pump settings, access points, and patient responses.

Exposure may vary widely among clinicians. A provider can be credentialed for critical care transport while encountering certain medications, devices, or infusion combinations only rarely. Errors may result from unfamiliar equipment, unclear handoff communication, line confusion, or insufficient preparation for complications.

Continuous competency could include infusion-pump practice, medication calculations, line tracing, compatibility review, structured handoff exercises, and scenarios involving hypotension,

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pump failure, extravasation, accidental disconnection, or medication depletion. Partnerships with hospital pharmacists, critical care nurses, and transport teams could strengthen curriculum development and case review. (Kaiser et al., 2022; McLaney et al., 2022)

Measurement might include medication and concentration verification, pump programming, line identification, documentation, response to alarms, recognition of adverse effects, and management of interruptions during transport.

Pediatric Resuscitation

Pediatric emergencies create a particularly demanding readiness problem. Most EMS clinicians encounter critically ill or injured children far less frequently than adults, yet pediatric resuscitation requires rapid decisions involving weight-based medications, age-specific physiology, appropriately sized equipment, airway management, vascular access, communication with caregivers, and team coordination. (Farrell et al., 2022)

Low exposure may increase anxiety and cognitive load, which can further impair performance. Pediatric readiness therefore requires repeated reinforcement rather than reliance on periodic certification. (Sarmiento et al., 2024; Zaphir et al., 2024)

A continuous system could include brief equipment-selection drills, length- or weight-based calculation exercises, medication preparation, pediatric airway practice, and progressive team simulations. Scenarios should address respiratory failure, cardiac arrest, shock, seizures, trauma, and neonatal emergencies. (Farrell et al., 2022)

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Case review should examine more than survival or procedural success. Relevant factors include recognition of deterioration, medication accuracy, equipment selection, compression and ventilation quality, destination decisions, family communication, and use of available pediatric-reference systems.

Hospital pediatric departments, children's hospitals, emergency physicians, pediatric educators, and regional specialty centers may support training and clinical review. Even where pediatric clinical rotations are limited, regional case conferences and shared simulation can strengthen readiness. (Farrell et al., 2022)

Other High-Acuity, Low-Frequency Procedures

The model can also be adapted to other skills and clinical events, including:

- Surgical or complex hemorrhage control.
- Transcutaneous or transvenous pacing support.
- Cardioversion in unusual clinical circumstances.
- Management of left ventricular assist devices.
- Extracorporeal support emergencies.
- Emergency tracheostomy management.
- Complex toxicological emergencies.
- Difficult extrication with ongoing resuscitation.
- Mass-casualty triage and clinical coordination.
- Specialized neonatal or critical care transport.
- Use of unfamiliar blood products or medication systems.
- Management of bariatric, burn, or other specialty patients.

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Not every procedure requires the same practice frequency, clinical partnership, or measurement strategy. Agencies should prioritize skills according to clinical consequence, frequency of exposure, evidence of performance variation, protocol requirements, workforce needs, and available resources. (Weber et al., 2024)

Prioritizing Expansion

The organization should not expand the system to every procedure simultaneously. Doing so may overwhelm instructors, clinicians, supervisors, data systems, and clinical partners. Expansion should occur after the initial model functions reliably and should follow a structured prioritization process. (Adelgais et al., 2019; Liu et al., 2021)

Leaders should consider:

1. How serious are the consequences of poor or delayed performance?
2. How frequently do individual clinicians encounter the procedure?
3. What performance or exposure gaps have been identified?
4. Can the skill be practiced realistically?
5. What clinical, educational, or regional partnerships are available?
6. Can meaningful performance measures be collected?
7. Does the organization have the capacity to sustain the added requirements?

Some procedures may require full integration into the continuous cycle. Others may be maintained through periodic concentrated training supplemented by brief cognitive or equipment exercises. The goal is not to impose identical requirements on every skill. It is to match the intensity of the competency system to the risk, complexity, and likelihood of skill decay. (Legoux et al., 2020; Weber et al., 2024)

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From Airway Competency to Clinical Readiness

Extending the system beyond airway management changes the organization's approach to professional readiness. Instead of maintaining separate training programs for unrelated skills, the agency develops a common infrastructure for standards, assessment, practice, exposure, feedback, measurement, and improvement. (Weber et al., 2024)

This shared infrastructure offers several advantages. Leaders can establish consistent governance. Educators can use common approaches to deliberate practice and scenario progression. Quality improvement personnel can connect field findings with training priorities. Clinicians can understand how competency is maintained across their scope of practice. External partners can support a coordinated readiness strategy rather than a series of isolated requests. (Vithalani et al., 2022; Weick & Sutcliffe, 2015)

Airway management may serve as the starting point because it demonstrates the problem and the solution clearly. It should not become the endpoint. The larger objective is an EMS organization capable of identifying which critical skills are vulnerable to decay and maintaining them deliberately before they are required during an emergency. (Legoux et al., 2020)

Continuous competency is therefore not an airway program with additional procedures attached. It is a comprehensive clinical-readiness system that can evolve with changing protocols, technologies, patient needs, and workforce conditions. Its purpose is to ensure that rare clinical encounters do not depend solely on what an individual clinician remembers from a course completed months or years earlier. (Weber et al., 2024; Weick & Sutcliffe, 2015)

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Recommendations for EMS Leaders

Building a continuous competency system requires more than revising a training calendar. It requires EMS leaders to align clinical standards, education, operations, medical oversight, quality improvement, workforce development, and resource allocation around the shared objective of sustained readiness. (Murray et al., 2024; Vithalani et al., 2022; Weick & Sutcliffe, 2015)

The following recommendations provide a practical pathway for leaders seeking to move from episodic skills verification to continuous competency.

1. Treat Competency Maintenance as an Organizational Responsibility

Clinicians retain responsibility for professional development and safe practice, but they do not control many of the conditions that determine whether competency can be maintained. Staffing, training schedules, equipment, access to clinical experience, quality assurance, performance data, and medical oversight are organizational responsibilities. (Rotteau et al., 2022; Vithalani et al., 2022).

"Organizations should measure readiness, not simply attendance."

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Leaders should therefore treat competency maintenance as part of clinical governance and operational readiness. Responsibility should be assigned across executive leadership, medical direction, education, supervision, and quality improvement. Expectations should be incorporated into policies, budgets, job responsibilities, and performance reporting rather than left to individual initiative. (Murray et al., 2024; Weick & Sutcliffe, 2015)

2. Establish Clear and Measurable Performance Standards

Organizations should define what competent performance looks like before designing training or evaluating clinicians. Standards should address more than completion of a procedure. They should include clinical judgment, patient selection, preparation, equipment use, technical execution, communication, complication management, backup planning, and post-procedure care. (Gage et al., 2024; Kunkes et al., 2022)

Standards should be approved by the medical director, aligned with agency protocols and current evidence, and applied consistently across the organization. Whenever possible, they should include observable behaviors and measurable outcomes. Clear standards allow clinicians to understand what is expected and give educators, reviewers, and supervisors a consistent basis for feedback. (Jarvis et al., 2023; Weber et al., 2024)

3. Replace Isolated Annual Verification With Continuous Practice

Annual skills verification may remain necessary for regulatory, credentialing, or compliance purposes, but it should not serve as the primary mechanism for sustaining readiness. A clinician's

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successful performance on one day does not demonstrate continued capability throughout the following year. (Legoux et al., 2020)

Agencies should supplement periodic verification with brief, frequent practice. Shift-based touchpoints, equipment exercises, focused technical drills, cognitive rehearsal, and progressive simulation can keep critical skills accessible between formal training events. (Bienstock et al., 2022; Wheeler & Dippenaar, 2020)

The goal is not continuous testing. It is continuous reinforcement. Practice should create opportunities to identify uncertainty, receive coaching, and correct performance before the skill is required during an emergency. (Legoux et al., 2020; Wayne et al., 2006)

4. Combine Simulation With Meaningful Clinical Exposure

Simulation provides repeatability, control, and the ability to reproduce rare or dangerous situations. It is indispensable for maintaining high-acuity skills, but it cannot fully reproduce real anatomy, physiological response, emotional pressure, or clinical variability. (Nielsen et al., 2021; Wheeler & Dippenaar, 2020)

EMS leaders should pursue meaningful clinical exposure through operating room rotations, hospital departments, anesthesia partnerships, cadaver laboratories, specialty programs, or regional clinical arrangements when feasible. These experiences should have defined objectives, appropriate supervision, and documented participation. (Trimmel et al., 2017)

Where real-patient opportunities are limited, agencies should increase the frequency and realism of simulation while pursuing regional or academic partnerships. Simulation and clinical exposure

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should be treated as complementary elements rather than competing alternatives. (Bienstock et al., 2022; Trimmel et al., 2017)

5. Review Every High-Risk Procedure

Quality assurance should not be limited to unsuccessful procedures, complications, or complaints. Every high-risk procedure can provide useful information about clinical judgment, preparation, technical performance, teamwork, equipment, and system conditions. (Vithalani et al., 2022)

Agencies should establish criteria and workflows for reviewing all applicable airway interventions and, as the system expands, other high-acuity procedures. Successful cases should be reviewed alongside difficult ones so that effective practices can be identified and reinforced. (Vithalani et al., 2022)

Review should examine the complete clinical episode rather than a single success-or-failure outcome. The objective is to understand what happened, why it happened, and what the organization should learn from it. (Vithalani et al., 2022; von Vopelius-Feldt et al., 2023)

6. Provide Timely, Specific, and Nonpunitive Feedback

Clinical experience does not reliably produce improvement without feedback. Leaders should establish expectations for how quickly cases are reviewed, who provides feedback, and how recommendations are documented and followed. (Vithalani et al., 2022)

Feedback should be specific enough to guide action. General statements such as “improve airway technique” provide little direction. Clinicians should understand what aspect of performance

requires attention, what standard applies, what support will be provided, and how improvement will be demonstrated.

Routine competency review should remain developmental and nonpunitive. Formal discipline may be necessary for reckless behavior, dishonesty, serious misconduct, or refusal to engage in required improvement, but most gaps should be addressed through coaching, practice, and reassessment. Psychological safety allows weaknesses to become visible before they contribute to preventable harm. (Murray et al., 2024; Rotteau et al., 2022)

7. Track Exposure, Performance, and Improvement Over Time

Leaders should not assume that clinicians receive sufficient exposure because the organization responds to an adequate number of cases collectively. Exposure may be distributed unevenly, leaving individual providers with long intervals between critical procedures. (Dyson et al., 2017; Thomas et al., 2024)

The organization should track frequency and recency of exposure, simulation participation, clinical rotations, procedural performance, complications, case review, feedback, and remediation. Measures should include clinical context and should not be reduced to a single score or public ranking. (Makrides et al., 2023; Vithalani et al., 2022)

A well-designed competency dashboard can help identify exposure gaps, delayed reviews, recurring performance concerns, and improvement following intervention. The purpose of measurement is to guide development and organizational decisions, not merely to accumulate data. (Redlener et al., 2024)

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8. Begin With a Manageable Pilot

Leaders should resist the pressure to implement a comprehensive system across every procedure and provider at once. Immediate systemwide implementation can create excessive cost, inconsistent execution, and resistance before the model has been tested. (Adelgais et al., 2019; Liu et al., 2021)

A pilot can begin with one high-priority procedure, station, shift, or provider group. The agency should establish baseline measures, define standards, test training and review workflows, collect feedback, and identify operational barriers. (Liu et al., 2021)

The pilot should be large enough to reveal practical problems but small enough to support closely. Findings should be used to simplify documentation, strengthen responsibilities, adjust scheduling, improve data collection, and estimate the resources required for expansion. (Adelgais et al., 2019; Liu et al., 2021)

9. Use Findings to Guide Funding and Expansion

Funding requests are stronger when they are based on documented needs rather than general statements about training. Baseline assessment and pilot results can show where exposure gaps exist, which processes require improvement, what resources are necessary, and how success will be measured. (Adelgais et al., 2019)

Leaders should use these findings to support agency budgeting, grant applications, hospital partnerships, academic collaboration, and regional cost-sharing proposals. Funding should be connected to a defined implementation plan rather than isolated equipment purchases.

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Expansion should also be evidence-informed. Before adding locations, personnel, or procedures, leaders should determine whether the existing model operates reliably, produces useful information, and can be sustained. Growth should follow demonstrated capacity rather than initial enthusiasm. (Liu et al., 2021; Rotteau et al., 2022)

10. Extend the System Gradually to Other Critical Procedures

Airway management provides a logical starting point, but the continuous competency system should ultimately support broader clinical readiness. Once the organization has developed reliable processes for standards, simulation, exposure, feedback, measurement, and improvement, the same infrastructure can be adapted to other high-acuity, low-frequency procedures. (Weber et al., 2024)

Potential areas include intraosseous access, thoracic decompression, cricothyrotomy, complicated childbirth, ventilator management, central-line infusions, pediatric resuscitation, and other locally identified priorities.

Expansion should be gradual and based on clinical risk, exposure frequency, observed performance gaps, and available resources. Not every procedure requires the same training frequency or evaluation process. Leaders should adapt the system's intensity to the complexity and consequences of each skill. (Legoux et al., 2020; Weber et al., 2024)

Leadership Priorities for Moving Forward

The central responsibility of EMS leadership is to create the conditions under which reliable performance is possible. Leaders cannot manufacture additional field cases, eliminate every

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staffing constraint, or guarantee that every high-risk procedure will have a favorable outcome. They can, however, determine whether clinicians receive regular practice, meaningful feedback, appropriate clinical exposure, standardized equipment, clear expectations, and organizational support. (Murray et al., 2024; Weick & Sutcliffe, 2015)

The most effective starting point is not necessarily the largest program. It is the smallest complete system the organization can operate reliably. That system should connect training, exposure, feedback, performance tracking, and leadership action. Once those connections function consistently, the organization can strengthen and expand them. (Liu et al., 2021; Vithalani et al., 2022)

Continuous competency becomes sustainable when it is no longer treated as a special project owned by the training division. It must become part of how the EMS organization governs clinical performance, develops its workforce, learns from patient care, and prepares for rare but consequential emergencies. (Rotteau et al., 2022; Weick & Sutcliffe, 2015)

Conclusion

EMS agencies cannot control how frequently clinicians encounter rare and critical emergencies. They cannot guarantee that every paramedic will receive regular field exposure to endotracheal intubation, cricothyrotomy, thoracic decompression, complicated childbirth, pediatric resuscitation, or other high-acuity procedures. They can, however, control how deliberately clinicians are prepared during the intervals between those events. (Thomas et al., 2024; Wang et al., 2024)

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Traditional certification, continuing education, and annual skills verification remain necessary, but they cannot independently sustain readiness for procedures that clinicians rarely perform. Competency changes over time. Technical skills become less automatic, equipment familiarity declines, and decision-making becomes more vulnerable to cognitive overload when opportunities for practice and feedback are limited. A successful evaluation at one moment does not guarantee reliable performance months later under difficult field conditions. (Bienstock et al., 2022; Legoux et al., 2020; Zaphir et al., 2024)

The solution is not simply more training. It is a coordinated organizational system that connects defined performance standards, frequent simulation, meaningful clinical exposure, case review, timely feedback, competency tracking, leadership support, and continuous quality improvement. Each component provides value, but the system becomes effective through the connections among them. Training prepares clinicians for exposure. Exposure produces experience. Feedback converts experience into learning. Performance tracking identifies changing needs. Leadership transforms those findings into resources, policies, and the next cycle of development. (Vithalani et al., 2022; Weick & Sutcliffe, 2015)

Implementation does not require an immediate organization-wide overhaul. EMS agencies can begin with an assessment of existing capabilities, select one high-priority procedure, establish baseline measures, and test the system through a manageable pilot. Early findings can reveal scheduling problems, resource needs, data limitations, cultural barriers, and partnership opportunities before broader expansion. This phased approach allows organizations to learn,

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refine, and demonstrate value while limiting operational disruption. (Adelgais et al., 2019; Liu et al., 2021)

Airway management offers a logical starting point because it clearly illustrates the consequences of declining exposure and fragmented competency support. The framework, however, has broader significance. Once the infrastructure for continuous competency is established, it can be adapted to other high-acuity, low-frequency procedures according to local risks, workforce needs, and available resources. The long-term objective is not merely better airway training. It is a more reliable system for sustaining clinical readiness across the EMS scope of practice. (Weber et al., 2024)

Continuous competency also changes how responsibility is understood. Clinicians remain accountable for engaging in practice, responding to feedback, and maintaining professional standards. Yet they cannot independently create clinical opportunities, protect training time, standardize equipment, establish hospital partnerships, collect performance data, or build a psychologically safe quality improvement process. Those conditions must be designed and sustained organizationally. (Murray et al., 2024; Rotteau et al., 2022)

Continuous competency transforms readiness from an individual expectation into an organizational capability. (Weick & Sutcliffe, 2015)

This transformation requires leadership. Policies must establish priorities, resources must support participation, responsibilities must be assigned, and performance findings must lead to action. Without sustained leadership commitment, even well-designed competency initiatives can

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become temporary projects that weaken as funding, personnel, or organizational attention changes. (Murray et al., 2024; Rotteau et al., 2022; Weick & Sutcliffe, 2015)

White Paper No. 3 will examine this leadership responsibility in greater depth. It will explore how EMS executives, chiefs, medical directors, educators, and supervisors shape clinical competency through governance, culture, accountability, resource allocation, and organizational learning. The next challenge is not simply to design a continuous competency system, but to provide the leadership required to sustain it.

Rare emergencies will always test EMS clinicians under conditions that cannot be completely predicted or controlled. Readiness for those moments must therefore be built before the call occurs. An organization that practices continuously, learns from experience, measures honestly, and responds deliberately is better positioned to protect its clinicians, strengthen patient care, and perform reliably when uncommon events carry the greatest consequences. (Vithalani et al., 2022; Weick & Sutcliffe, 2015)

The Future of EMS Competency

Every meaningful advancement in Emergency Medical Services has required organizations to rethink long-standing assumptions. EMS has evolved from basic transport to advanced life support, from isolated clinical interventions to evidence-based medicine, and from reactive quality assurance to continuous quality improvement. The next evolution is already beginning.

It is the transition from episodic training to continuous clinical readiness.

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Imagine an EMS agency where every paramedic begins each shift with a few minutes of deliberate practice, reinforcing critical skills before responding to the day's first emergency. High-acuity procedures are no longer reserved for annual skills verification but are practiced continuously, becoming familiar, instinctive, and reliable.

Imagine an organization where every advanced airway encounter is reviewed, not to assign blame, but to identify opportunities for learning. Each patient becomes an opportunity to strengthen both the individual clinician and the system that supports them. Successes are studied alongside challenges because excellence deserves to be understood just as much as failure.

Imagine leaders who no longer wait for a serious complication to discover that a clinician's skills have begun to decline. Instead, competency is continuously measured through meaningful performance indicators, allowing subtle gaps in clinical exposure, confidence, or proficiency to be recognized early. Support is provided before performance deteriorates. Coaching replaces crisis intervention.

Imagine medical directors who have objective, real-time information about the readiness of their workforce. Rather than relying solely on annual reports or isolated observations, they can see patterns, evaluate trends, guide educational priorities, and make decisions based on evidence rather than assumptions.

Imagine educators whose training programs are driven by actual field performance instead of predetermined schedules. Simulation scenarios are developed from recent clinical cases. Coaching focuses on documented needs. Every exercise has a purpose because every lesson is connected to measurable performance.

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Imagine quality improvement programs that do more than collect data. They become engines of organizational learning, transforming clinical experiences into better policies, stronger education, improved leadership decisions, and safer patient care.

Most importantly, imagine a workforce that approaches every shift with confidence, knowing that readiness has not been left to chance. Competency is not something that was demonstrated months ago during an annual evaluation. It is something that has been reinforced yesterday, practiced today, and will continue to be strengthened tomorrow.

This future is neither unrealistic nor unattainable. Many EMS organizations already possess the essential components: committed leaders, dedicated clinicians, medical oversight, simulation resources, quality improvement programs, and educational expertise. The challenge is not creating these elements. The challenge is connecting them into a single, coordinated system that continuously sustains readiness.

The future of EMS competency will not be defined by more training alone. It will be defined by organizations that intentionally integrate leadership, practice, clinical experience, performance measurement, feedback, and continuous improvement into the daily rhythm of patient care.

That future begins with a simple but transformative shift in thinking.

Competency is not an event.

It is not a certificate.

It is not an annual skills test.

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It is an organizational capability that must be intentionally cultivated, continuously measured, and relentlessly sustained.

The agencies that embrace this philosophy will do more than maintain clinical skills. They will build resilient organizations, strengthen professional confidence, improve patient safety, and establish a new standard for excellence in Emergency Medical Services.

The future of EMS will not belong to the organizations that train the hardest.

It will belong to the organizations that remain ready every day. The next paper in this series examines the role of organizational leadership in creating and sustaining continuous competency systems across modern EMS agencies.

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Ronald Rivers, DM, MBA, is the founder and president of Sentinel Skills Systems, Inc., a healthcare readiness company focused on improving procedural competency among emergency medical providers. He completed his Doctor of Management degree at the University of Phoenix, where his research examined the organizational, educational, and leadership factors influencing paramedic endotracheal intubation performance. His work focuses on continuous competency systems, simulation-based training, quality improvement, workforce development, and organizational leadership within Emergency Medical Services. Dr. Rivers has published multiple peer-reviewed articles on EMS airway competency and clinical readiness.

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