

Assessing Team Leadership in Emergency Medicine: The Milestones and Beyond

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ABSTRACT

Background Team leadership is a critical skill for emergency medicine physicians that directly affects team performance and the quality of patient care. There exists a robust body of team science research supporting team leadership conceptual models and behavioral skill sets. However, to date, this work has not been widely incorporated into health care team leadership education.

Objective This narrative review has 3 aims: (1) to synthesize the team science literature and to translate important concepts and models to health care team leadership; (2) to describe how team leadership is currently represented in the health care literature and in the Accreditation Council for Graduate Medical Education Milestones for emergency medicine; and (3) to propose a novel, evidence-based framework for the assessment of team leadership in emergency medicine.

Methods We conducted a narrative review of the team science and health care literature. We summarized our findings and identified a list of team leadership behaviors that were then used to create a framework for team leadership assessment.

Results Current health care team leadership measurement tools do not incorporate evidence-based models of leadership concepts from other established domains. The emergency medicine milestones include several team leadership behaviors as part of a larger resident evaluation program. However, they do not offer a comprehensive or cohesive representation of the team leadership construct.

Conclusions Despite the importance of team leadership to patient care, there is no standardized approach to team leadership assessment in emergency medicine. Based on the results of our review, we propose a novel team leadership assessment framework that is supported by the team science literature.

Introduction

Team leadership is a critical team skill that directly impacts team performance and patient care.^{1–3} In a report by The Joint Commission, failures in team leadership were linked to more than 50% of adverse events in acute health care settings.⁴ Additionally, a study of health care teams identified lack of a proficient team leader as a significant safety risk.⁵ Team leadership is even more critical under the uncertain and time-pressured conditions faced in the emergency department setting.⁶ Several widely implemented clinical training programs (eg, Advanced Cardiovascular Life Support, Pediatric Advanced Life Support, and Advanced Trauma Life Support) include a team leadership component, reinforcing the importance that team leadership plays in the provision of advanced resuscitation care.^{7–9} There has also been increased emphasis on team leadership training and assessment in graduate medical education overall,^{10,11} and within the specialty of emergency medicine (EM).¹²

While the number of studies describing efforts in team leadership training and assessment has risen exponentially over the past decade, the best mechanisms for effectively training and assessing team leadership within EM remain elusive.^{13,14} This knowledge gap leaves EM residency programs to approach this task in isolation, resulting in a wide variation in how team leadership is defined, trained, and assessed. The objective of this review article is to (1) synthesize the team science literature and translate important concepts and models to health care team leadership; (2) describe how team leadership is currently assessed within the health care literature and in the Accreditation Council for Graduate Medical Education (ACGME) milestones for EM; and (3) propose a novel, evidence-based framework for team leadership assessment in EM.

Methods

We conducted a narrative review of the team science and health care literature. Pertinent work was identified from the following sources: (1) team science subject matter experts identified relevant review articles related to principles of team leadership in health care and non-health care literature^{2,15–21}; (2) two recent systematic reviews on team leadership

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Editor's Note: The online version of this article contains explanations and clinical examples for proposed team leadership behaviors.

training and assessment in health care teams^{13,14}; and (3) the current ACGME EM Milestone Project.²² The references from all reviewed materials were hand searched to identify additional pertinent publications.

Through the review process we identified a list of possible team leadership behaviors. From this list we selected behaviors that met the follow criteria: (1) pertinent to EM; (2) clearly observable; (3) representative of performance across educational levels (eg, intern, resident, attending); and (4) not redundant with other EM milestones. This EM-specific list underwent a second review process to ensure that concepts were consistent with the team science literature and supported by evidence linking the behavior to effective team leadership. To facilitate understanding and implementation of the assessment framework, we organized the final list of behaviors as milestones within a “Team Leadership” subcompetency. The authors independently reviewed each behavior and assigned milestone levels. When necessary, group discussion was used to achieve consensus.

Understanding the EM Team

To understand team leadership, it is important to understand the nature of EM teams. Emergency medicine teams fall into a specific category of teams called interdisciplinary action teams.^{20,23} These teams contain highly specialized members who must cooperate to execute critical tasks under highly dynamic situations, often while simultaneously training and developing more novice team members, such as students and residents. This is distinct from a more general leadership construct that often refers to motivational and mentoring skills, content expertise, and project/program management.^{10,24} While these general forms of leadership are important, they do not capture leader functions critical to the acute management of a single patient (eg, code team leadership) or multiple patients (eg, mass casualty incident command).

Evidence from the team science literature supports several key characteristics of effective leadership within interdisciplinary action teams. Team leadership is (1) functional, (2) contingent, (3) shared, and (4) dynamically delegated. *First*, leadership is functional, meaning it is the job of the team leader to ensure that team members are getting their tasks accomplished and to step in when things are not being adequately handled.^{2,25} Team leaders provide overall structure and direction to the team, monitor the task and other team members’ activities, coach team members as appropriate, and occasionally perform necessary hands-on patient care.¹⁵ Implicit in this description is that the team leader possesses clinical

competency. *Second*, leadership is contingent. In action teams, which team leadership behaviors are effective is contingent on multiple factors, such as patient condition and stability, characteristics of team members (eg, experience level, familiarity), and environmental status (eg, current census, overall emergency department patient acuity, availability of additional resources).^{20,26} *Third*, EM team leadership in academic settings often is shared between formal leaders and trainees, with supervising physicians delegating leadership roles, implicitly or explicitly, to residents. *Finally*, in more dynamic situations, the team leader can change on a minute-by-minute basis, but effective leadership is always delegated and never shared simultaneously.²⁰ Team leadership in academic EM teams is therefore said to be dynamically delegated, with more experienced physicians assuming leadership when dictated by a combination of patient, team, and environmental factors.²⁰ Leadership characteristics vary with team type, which makes understanding the leadership characteristics specific to EM teams essential to designing and implementing appropriate leadership training and assessment tools.

Team Leadership Conceptual Models

Conceptual models play an important role in formulating well-grounded solutions to education problems by guiding design principles and helping to identify important variables and potential relationships that need to be considered during measure development.²⁷ During the 2008 Academic Emergency Medicine Consensus Conference on “The Science of Simulation in Healthcare,” Fernandez et al¹⁹ proposed a model and taxonomy of EM teamwork based on evidence from the team science literature.^{28,29} In this model, different teamwork behaviors are critical depending on the task work required.¹⁹ During episodes of care when the demand for task work is high, teamwork is characterized by *action processes* (monitoring, coordinating, backup) that facilitate accomplishing team goals. These episodes of high activity are separated by periods where teams execute *transition processes* (planning and evaluation) that facilitate planning and reflection. Underlying both action and transition processes are interpersonal factors (conflict resolution, communication, team building) that influence all team activities. A recent review cited this model and taxonomy as a rigorously developed framework for EM team processes.³⁰ This taxonomy is supported by evidence of validity within health care.³¹

The team science literature provides a team leadership model that helps describe the link between teamwork and team leadership. It considers the dynamic, functional nature of action teamwork and

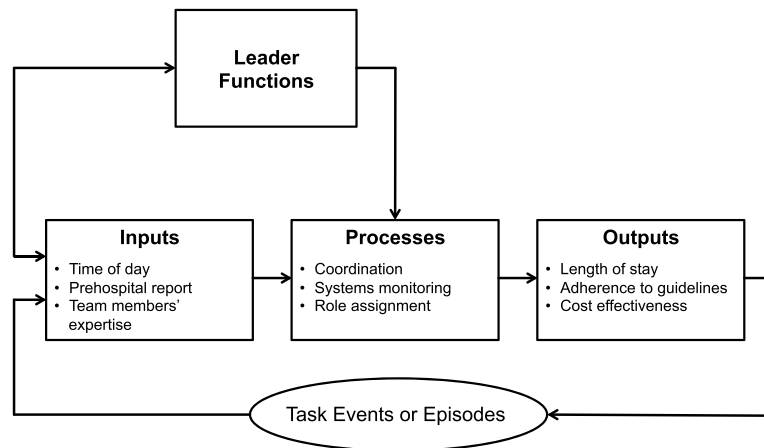


FIGURE 1
Model of Dynamic Team Leadership for Emergency Medicine Teams¹⁵

leadership, where teamwork translates individual team member and patient characteristics (inputs) into patient care and outcomes (outputs), and outputs from one team event feedback as inputs into the next (FIGURE 1).^{15,29,32} Such feedback is necessary if teams are to adapt effectively. The ability for teams to adapt from one event to the next is critical in EM teams, where events rapidly cycle and overlap (eg, intubation, chest tube placement, ultrasound examination), and outcomes from one event impact decision making and team functioning on the following events.^{16,33,34} In this model, team leaders support the maintenance, development, and effectiveness of teams.¹⁵ The leader is in a position to impact outcomes by directly influencing *team inputs* and *teamwork behaviors* (FIGURE 1).

This team leadership effectiveness model provides a framework for understanding where leaders can influence EM team effectiveness; however, it does not clearly describe which leadership behaviors are most effective. Morgeson et al¹⁸ described a functional team leadership taxonomy that is structured around transition behaviors, action behaviors, and interpersonal skills. Observational studies and reviews of health care leaders have identified components of this taxonomy important to health care team leadership.^{35–38} Team leaders develop team structure, help establish goals, set team priorities, and assign roles (transition behaviors); monitor the team's progress, coordinate complex activities, and assist teammates when needed (action behaviors); and facilitate conflict resolution and build team cohesion (interpersonal skills).^{16,18} While Morgeson et al's taxonomy is domain independent and not specific to EM teams, it does support maintaining a transition and action process structure and provides a starting

point for identifying effective EM team leadership behaviors.¹⁸

Current Assessment Practices in EM

Despite a growing focus on assessment of leadership skills, there is little research specific to EM.¹⁴ One attempt to standardize resident assessment is the ACGME Milestone Project for EM, created in 2012.²² Building on the original ACGME competencies, the milestones provide specialty-specific detail to each core competency.^{39–44} Each competency is divided into 1 or more subcompetencies. For example, the interpersonal and communication skills competency has 2 subcompetencies: (1) patient-centered communication, and (2) team management. The subcompetencies are further broken down into milestones, which range from level 1 (anticipated skill level of an incoming intern) to level 5 (skill level of an experienced physician). Level 4 milestones represent competency and are the targeted, but not required, level for graduation. EM residency programs are responsible for evaluating residents on the milestones on a semiannual basis and reporting the results to the ACGME. FIGURE 2a provides a representation of the team management subcompetency.

When looking through the subcompetencies, team management appears to most closely match team leadership (FIGURE 2a). However, on further examination, we found that the level 5 milestones relate to managerial type leadership rather than leading action teams (eg, “seeks leadership opportunities within professional organizations”). The majority of the other milestones relate to interpersonal skills, more specifically communication skills. This is consistent with the location of the team management subcompetency within the interpersonal and communication skills domain. While communication skills are an

a

Team Management: Leads patient-centered care teams, ensuring effective communication and mutual respect among members of the team.				
Level 1	Level 2	Level 3	Level 4	Level 5
Participates as a team member	Communicates pertinent information to emergency physicians and other healthcare colleagues	Develops working relationships across specialties and with ancillary staff Ensures transitions of care are accurately and efficiently communicated Ensures clear communication and respect among team members	Recommends changes in team performance as necessary for optimal efficiency Uses flexible communication strategies to resolve specific ED challenges such as difficulties with consultants and other health care providers Communicates with out-of-hospital and nonmedical personnel, such as police, media, and hospital administrator	Participates in and leads interdepartmental groups in the patient setting and in collaborative meetings outside of the patient care setting Designs patient care teams and evaluates their performance Seeks leadership opportunities within professional organizations

b

Team Leadership: Is capable of effectively directing an interdisciplinary team of healthcare providers during routine and non-routine patient care events; directs care at the patient, team, and unit level when needed.				
Level 1	Level 2	Level 3	Level 4	Level 5
Asks for help when appropriate Treats team members with respect	Assigns roles to team members Formulates and communicates a plan Communicates clearly	Sets and communicates priorities for patient care Monitors team progression towards goals Maintains big picture Effectively manages individual patient resources	Formulates and communicates a contingency plan Assists/coaches other providers Balances authority and team member input Copes with pressure and distractions	Effectively debriefs team Effectively manages system resources Motivates team members Manages conflict effectively

FIGURE 2

Behaviors Included in Existing “Team Management” Subcompetency From Emergency Medicine Milestone Project²² (a), and Proposed Team Leadership Behaviors for Emergency Medicine Presented as Milestones Within a Subcompetency, Modeled After the American Council for Graduate Medical Education Emergency Medicine Milestone Project (b)

important focus in EM, they are not the only skills critical to effective team leadership.⁴¹ As noted earlier, transition processes (eg, evaluation and planning) and action processes (eg, patient and system monitoring) are critical to team effectiveness.^{16,18} Only 1 of the milestones (level 4.1 “recommends changes in team performance as necessary for optimal efficiency”) describes a team leadership behavior beyond communication skills; in this case, the “action process” of monitoring team progress toward a goal. In light of the more comprehensive view of team leadership, the existing team management subcompetency alone is not sufficient for assessing action team leadership skills.

There are individual milestones located in other subcompetencies that could potentially represent team leadership behaviors if assessed in the appropriate context. For example, “involves appropriate resources in a timely manner” could exemplify the “action process” of systems monitoring if performed

during the resuscitation of a critically ill patient. This behavior, however, is a milestone within the “disposition” subcompetency and is defined by the subheading “establishes and implements a comprehensive disposition plan that uses appropriate consultation resources; patient education regarding diagnosis; treatment plan; medications; and time and location specific disposition instructions.” In this setting, the behavior is not representative of action team leadership skills. This is more than just semantics: it is easy to imagine how an individual could be capable of arranging a timely outpatient appointment for a patient with asymptomatic hypertension, but struggle with mobilizing resources for an acutely hypotensive patient, or vice versa. These different skill sets highlight the importance of team and task typology when discussing leadership. There are additional examples of such context-dependent behaviors throughout the milestones. While the milestones are not meant to be comprehensive, the importance of

team leadership to team performance and patient outcomes suggests this critical skill deserves more focus in the training and assessment of EM residents.

Moving beyond the ACGME milestones, there is a paucity of literature related to team leadership assessment in EM. The authors' review of team leadership assessments in health care action teams identified 15 assessment tools that focused on team leadership, with just 1 intended for EM teams.¹⁴ The Emergency Medicine Crisis Resource Management assessment tool was derived from its training course⁴⁵ and applied to trauma teams.^{46,47} This tool includes 10 items, such as "utilization of information" and "communication with other team members" as well as overall global performance, with a scale from 1 ("not acceptable") to 5 ("excellent"). The scale may prove useful; however, as it is currently described, the scale lacks behavioral anchors and has not been rigorously studied or widely applied to EM teams.

New Approach to Assessing Team Leadership in EM

We propose a novel framework for assessing EM team leadership that synthesizes the above work. The review of team leadership assessment tools identified 30 team leadership behaviors important to a variety of health care action teams, including EM teams, trauma teams, inpatient code teams, surgical teams, and obstetrical teams.^{13,14} We collapsed these into 12 categories (TABLE). From this list, 17 behaviors met inclusion criteria, including 5 related to transition processes (evaluation and planning), 6 related to action processes, and 6 related to interpersonal skills. The proposed team leadership subcompetency, using these behaviors as milestones, is presented in FIGURE 2b.

It is necessary to clearly define these behaviors to facilitate a consistent interpretation and application of the proposed framework (provided as online supplemental material). This is important for 2 reasons. First, variations in interpretation could lead to different perceptions of the appropriate difficulty level of a given behavior. For example, "assigns roles to team members" is listed as a level 2 milestone. This skill involves assigning roles based on team member skills and task requirements, thus requiring knowledge of team structure beyond what one would expect of an intern. However, one could expand the definition of this behavior to also include role assignments that promote an even distribution of the workload. This simple modification requires a familiarity with the skill sets of the individual team members, monitoring of team activities, and role reassignment if a team member becomes overwhelmed. Second, some behaviors may appear to

overlap with existing milestones. The subtleties of context are key to differentiating these behaviors. For example, "monitors team progression toward goals" has similar wording to some of the milestones in the observation and reassessment subcompetency, such as "evaluates effectiveness of therapies and treatments provided during observation." In the existing milestone, the unit of focus is the patient rather than the team. Effectively monitoring team progress includes monitoring the actions of the team and its members and addressing delays in task completion, in addition to monitoring the condition of the patient. Explanations and clinical examples for all behaviors are provided as online supplemental material.

Discussion

Effective team leaders elevate the performance of the team, help the team adapt to changes in their environment, and ensure that team performance remains strong despite environmental or patient care challenges.² Behaviors necessary for effective leadership are largely dependent on the nature of the team, the task, and the environment. Our review focuses on EM teams, which are characterized as extreme action teams.²⁰ We highlight the lack of, and need for, a more comprehensive approach to leadership assessment in EM. The ACGME EM milestones address some aspects of leadership, but this effort is narrowly focused on communication and interpersonal skills. We identified key team leadership behaviors relevant to EM teams and organized them in the now-familiar format and language of the milestones to facilitate use by EM educators.

Throughout this process, we took caution not to imply that an additional EM subcompetency is the optimal solution for team leadership assessment. Rather, we highlight team leadership as a critical skill for EM physicians and identify key leadership behaviors that are not represented by the current milestones. The proposed framework for assessing team leadership (FIGURE 2b) could be implemented as a stand-alone assessment tool or incorporated as an additional subcompetency if so desired. Either approach would help to address this important set of skills that is not adequately captured using available assessment tools.

Team leadership is challenging to assess independently of the metrics used. Patient, team, and environmental variables can impact team and leader performance, making it a challenge to isolate team leader performance. Medical educators are generally interested in the leadership skills of individual residents. To assess the leadership skills of an individual, one must account for team and patient

TABLE

Team Leadership Behaviors From Health Care Action Teams¹⁴ Applied to Team Leadership Taxonomy

Leadership Behavior Dimensions	Examples
Transition (evaluation and planning) processes	
Mission analysis ¹⁸	- Team leader (re)assesses the situation and briefs team - Team leader incorporates team members' suggestions, confirms team members' understanding of situation, and keeps team informed of changes to plan
Goal specification ^{2,48}	- Team leader assigns tasks and sets expectations and goals for team - Team leader correctly implements established guidelines to meet standards
Strategy formulation ^{49,50}	- Team leader plans/decides what to do and how to do it - Team leader provides direction/uses command statements/makes firm decisions - Team leader creates a new plan in response to changes in patient status - Team leader prioritizes activities - Team leader thinks ahead and creates contingency plans
Reflection ²	- Team leader debriefs the team and provides feedback - Team leader identifies areas for team improvement
Action processes	
Patient monitoring ¹⁸	- Team leader monitors progress of patient/notes when patient is not responding as expected - Team leader notices unexpected, relevant changes in patient condition
Systems monitoring ¹⁸	- Team leader asks for help when needed and facilitates team problem solving - Team leader maintains a big picture view - Team leader engages in time management for tasks - Team leader manages team progression toward goals - Team leader notices changes in the system/team environment - Team leader manages resource utilization
Assisting/backup behavior ^{15,35}	- Team leader identifies errors - Team leader manages team member workload - Team leader coaches, provides supervision or assistance as needed
Coordination ²⁰	Team leader coordinates activities according to set priorities
Interpersonal skills	
Conflict management ^{18,51,52}	Team leader assists with conflict resolution
Affect management ^{49,53,54}	- Team leader is approachable/has a positive attitude - Team leader treats all team members with respect - Team member balance is appropriately assertive, balancing authority and team member participation - Team leader remains calm, manages noise distraction
Motivation/empowering ^{18,55}	Team leader motivates and empowers team members
Communication ^{53,56}	Team leader communicates clearly and closed loop communication

variables, which is a task that is both challenging and poorly understood. A potential solution to this problem is to observe an individual resident across a large number of team resuscitations. However, this presents a feasibility challenge as direct observation of a large number of residents over an adequate number of resuscitations is a daunting task. Furthermore, if a resident is struggling during a resuscitation, another individual may intervene, thereby confounding the assessment. Simulation-based assessment offers another potential solution.⁵⁷ Simulation provides a standardized platform (patient, clinical scenario, and team members) leaving the team leader as the only variable. While this addresses many of the above issues, a simulation that recreates an entire team is extremely resource intensive and still has the limita-

tion of an artificial environment. Currently, there is no strong evidence linking team leadership performance during simulated events to team leadership during actual patient care.

Finally, it is important to note that our work focused on defining effective team leadership behaviors because behaviors can be directly targeted for training and directly observed for assessments. There are other important team leadership outcomes that have a significant impact on team performance and outcomes, including development of mutual trust, team cohesion, and psychologic safety.^{25,58–60} Measurement of these constructs is difficult, yet future work focused on these leadership outcomes is important if we are to fully understand

the impact of team leadership, leadership training, and team performance in health care and EM.

Regardless of whether the proposed leadership behaviors are applied as a subcompetency or in another format, additional work is needed to establish evidence of validity to support the proposed team leadership behaviors and the organization of these behaviors. Our rigorous literature review and the involvement of subject matter experts provides evidence of content validity. Additionally, the application of a conceptual leadership model and evidence-based taxonomy structure ensures a framework for leadership skills assessment that is robust and methodologically sound. Limitations of our review include that it is based on the published literature, and other tools and models may exist of which we were unaware. In addition, empirical testing is necessary to establish further validity evidence from other sources, including relationship to other team-related performance assessments, reliability, and response process.

Conclusion

Our review of the team leadership literature relevant to EM represents a first step toward developing evidence-based, theoretically grounded team leadership measures for EM teams. Further work must be done to demonstrate evidence of validity and to guide implementation of team leadership assessments within EM training programs. Considering the important role team leadership plays in the provision of safe patient care, it is critical we establish methodologically sound mechanisms for determining team leadership competency.

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