Team leadership in the intensive care unit: The perspective of specialists*

Tom W. Reader, PhD; Rhona Flin, PhD; Brian H. Cuthbertson, MD, FRCA

Objectives: **To identify the behaviors senior physicians (e.g., specialists, staff attendings) report using to lead multidisciplinary teams in the intensive care unit.**

Design: **Semistructured interviews focusing on team leadership, crisis management, and development of an environment that enable effective team performance in the intensive care unit.**

Setting: **Seven general intensive care units based in National Health Service hospitals in the United Kingdom.**

Participants: **Twenty-five senior intensive care medicine physicians.**

Measurements and Main Results: **Responses to a semistructured interview were transcribed and subjected to "content" analysis. The interview analysis focused on references to the "functional" behaviors used by leaders to manage team performance and the "team development behaviors" used to build the conditions that enable effective team performance. Seven of the interviews were coded by a second psychologist to measure inter-rater reliability. Inter-rater reliability (Cohen's κ) was acceptable for both scales ($\kappa = 0.72$ and $\kappa = 0.75$). In total, 702 functional leadership behaviors (behaviors for information gathering, planning and decision-making, managing team members) were coded as being used to manage the intensive care unit, along with 216 team development behaviors (for providing team direction and establishing team norms). These behaviors were grouped together in a theoretically driven framework of intensive care unit team leadership.**

Conclusions: **Intensive care unit senior physicians report using a variety of leadership behaviors to ensure high levels of team performance. The data described in this study provide insight into the team leadership behaviors used by intensive care unit team leaders and have implications for the development of team leadership training and assessment tools. (Crit Care Med 2011; 39: 1683–1691)**

KEY WORDS: intensive care unit; leadership; team leadership; teamwork; patient safety; training

Team leadership refers to the actions undertaken by a team leader to ensure the needs and goals of a team are met (1). Team leadership is distinct from organizational or strategic leadership (2), and a team leader can be characterized as the individuals engaged in, and responsible for, guiding a team through its work cycle (1). Psychology research shows the skills and behaviors of team leaders (e.g., for defining goals, setting expectations, monitoring teamwork) to predict team performance in experimental and work settings (2–8). In the intensive care unit (ICU), team leadership is crucial for determining the extent to which teams provide coordinated and safe patient care (Fig. 1) (9–13). Senior ICU physicians (e.g., specialists, staff attendings, or consultants) are usually identified as the team leader because of their formal responsibilities for providing patient care, although other team members (e.g., fellows and nursing staff) may also demonstrate leadership behaviors (14, 15). The importance of leadership in the ICU is acknowledged by current training systems (e.g., the Competency-Based Training program in Intensive Care Medicine for Europe [CoBaTRICE] program) (16). However, there is only limited research on the specific skills and behaviors that constitute, and are indicative of, effective team leadership in the ICU (12), and there is a need to integrate healthcare leadership research with psychology theory (17). Other high-risk industries have identified important leadership behaviors in granular detail to build detailed training programs (18–20), and such research would be informative for developing ICU team leadership training and assessment tools.

This article aims to capture in detail the behaviors used by ICU team leaders to lead teams during both normal and emergency situations (termed functional leadership behaviors) (21, 22), along with the behaviors taken to create conditions that enable effective team performance (termed team development behaviors) (21, 23, 24). These behaviors are particularly relevant for the ICU. For example, senior physician information gathering activities (e.g., reviewing patient notes, discussions with nursing staff), decision-making processes (e.g., during emergency scenarios), and support of team members (e.g., supervising trainees) are functional leadership behaviors important for ICU team performance (12, 25–27). Senior physician team development behaviors such as developing team norms (e.g., a culture of open communication) and shared team goals are also important for safety (12, 28). We aim to develop a framework of the leadership behaviors used by ICU team leaders to guide their

*See also p. 1835.

From the Institute of Social Psychology (TWR), London School of Economics, London, UK; School of Psychology (RF), University of Aberdeen, Kings College, Aberdeen, Scotland, UK; Department of Critical Care Medicine (BHC), Sunnybrook Health Sciences Centre, Toronto, Canada.

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For information regarding this article, E-mail: t.w.reader@lse.ac.uk

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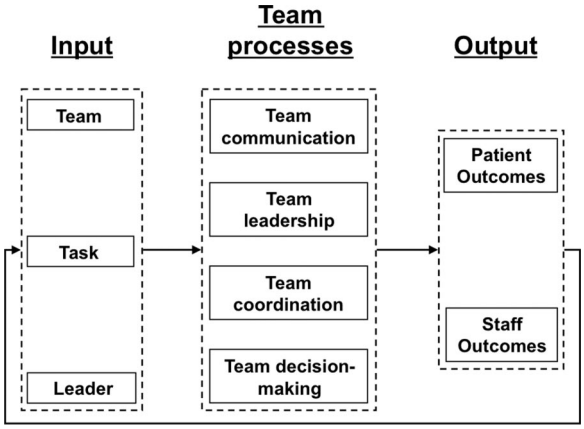

Figure 1. Input–process–output model used to explain team performance in the intensive care unit (12).

Table 1. Dimensions of functional leadership behaviors and team development behaviors that underpin effective team performance (8, 21–23)

Functional Leadership Behaviors: Context-Specific Behaviors or Thought Processes Used to Facilitate Team Performance	Team Development Behaviors: Development of the Underlying Conditions Necessary for Facilitating Team Performance
Information gathering: The leader's "systematic search, acquisition, evaluation, and organization of information regarding team goals and operations" (8)	Providing team direction: Motivating team members and ensuring they have a clear and challenging role
Planning and decision-making: The leader's application of information to structure solutions in the pursuit of a team goal	Establishing team norms: Establishing team norms (i.e., rules governing interactions and cooperation between team members) that encourage effective teamwork
Managing team members: Obtaining, assessing, developing and motivating personnel, utilizing personnel to enact a plan, and monitoring the progress of the team/team members	Coaching: Helping and ensuring that team members develop their skills
Managing materials: Obtaining and allocating material resources, utilizing resources to enact a plan, and monitoring the status of material resources	Providing organizational support: "Design of rewards systems, information systems, and training opportunities" (21)

teams in providing safe and effective patient care.

MATERIALS AND METHODS

Participants. All senior ICU physicians (UK consultants) from seven hospitals (two District General and five University hospitals) in the UK were contacted by letter to volunteer for the study (n = 41). In total, 25 agreed (60%). On average, they had been in position for 11 yrs (range, 1–25 yrs), with 22 males and 3 females. Ethical approval was given by National Health Service Research Ethics Committee.

Design. A semistructured interview applying a variation of the critical incident technique was used (29). Experts are asked to describe their behaviors during a complex task when they performed effectively. Insight is gained into the specific skills and behaviors underpinning successful task performance. The interviews focused on leadership behaviors used by senior physicians to lead ICU teams during routine and emergency phases of work.

Team Leadership Theory. Current team leadership theory guided interview protocol design and data analysis (21–23). This literature shows team leaders using functional leadership behaviors to influence team performance as a task is performed and team development behaviors to develop the conditions/environment within which team members will perform effectively. Table 1 defines and lists the categories of behavior that underpin each dimension of team leadership.

Interview Protocol. Industrial psychologists and intensive care specialists developed the interview schedule (Appendix 1). The interview content was influenced by interviewing principles (30, 31), previous ICU leadership research (9, 12), and team leadership theory (21–23, 32). Minor changes to the schedule were made after piloting. The interview structure was as follows: phase 1, interviewees described a routine day in ICU, focusing on how they led the ICU team to provide effective patient care; phase 2, interviewees recalled a critical event in ICU and described the scenario, the team's performance, outcomes, and their leadership of the team; and phase 3, interviewees discussed the general leadership skills or behaviors they thought important for producing effective (or ineffective) team performance.

The interview protocol included open-ended or direct questions, and additional generic prompts were used to spontaneously elicit information (e.g., "how did you communicate this?", or "what indicated this to you?"). The interviews were conducted by a single interviewer (T.R.). All interviews were digitally recorded and transcribed verbatim for analysis.

Analysis of Interviews and Coding Reliability. Interviews were analyzed using content analysis (30), whereby transcripts are analyzed using an *a priori* framework to identify whether the interview captures concepts of interest. Coders applied the following analysis procedure with each interview transcript being read without notes being made; analyzed to identify and code statements referring to functional leadership behaviors (Table 1); and analyzed to identify and code statements referring to team development behaviors (Table 1).

All interviews were coded by a single coder (T.R.), with a randomly selected sample of seven interviews being independently coded by a trained Human Factors psychologist. An acceptable level of inter-rater reliability using Cohen's κ coefficient (33) was found between coders for statements relating to functional leadership behaviors (κ = 0.72) and team development (κ = 0.75).

RESULTS

Senior physicians (n = 25) described the medical team as a hierarchical structure consisting of themselves and senior and junior trainee physicians. The nursing team was described as a hierarchical structure of senior and bedside nurses. Although senior physicians described leading the ICU team, the overlap between medical and nursing teams was not always clear. Furthermore, support staff members were often considered part of the wider ICU team. The senior physicians focused mainly on their leadership of the medical team, although interactions with nurses were discussed.

All interviewees discussed a "unit assessment" phase at the beginning of a standard day in the ICU. Most senior physicians (n = 21) described conducting an initial informal brief assessment on ar-

Table 2. Number and percentage of references to functional leadership behaviors and team development behaviors made by senior physicians (n = 25) according to interview phase

Functional Leadership Behaviors					Team Development Behaviors				
	Interview Phase I %	Interview Phase II %	Interview Phase III %	Total (%)		Interview Phase I %	Interview Phase II %	Interview Phase III %	Total (%)
Information gathering	145 (29.2)	31 (15.5)	0 (0)	176 (25.1)	Providing team direction	37 (27.8)	1 (0.6)	26 (36.6)	64 (29.6)
Planning and decision-making	111 (22.3)	51 (25.5)	0 (0)	162 (23.1)	Establishing team norms	47 (35.3)	6 (3.4)	35 (49.3)	88 (40.7)
Managing team members	222 (44.7)	112 (56)	4 (100)	338 (48.1)	Coaching	46 (34.6)	5 (2.9)	8 (11.3)	59 (27.4)
Managing materials	17 (3.4)	4 (2)	0 (0)	21 (2.9)	Providing organizational support	1 (0.8)	0 (0)	2 (2.8)	3 (1.4)
Other	2 (0.4)	2 (1.1)	1 (0)	5 (0.8)	Other	2 (1.5)	0 (0)	0 (0)	2 (0.9)
Total	497	200	5	702	Total	133	12	71	216

Phase I: Leadership behaviors reported by senior physicians as being used to lead the intensive care unit team on a typical day.
Phase II: Leadership behaviors reported by senior physicians as being used during an emergency.
Phase III: General leadership behaviors that result in effective team performance.

rival, when they identified new patients, made *ad hoc* management plans, met team members, and initialized urgent treatments. All senior physicians referred to a subsequent in-depth unit assessment phase (i.e., the morning round) when patient information was collected from team members, diagnoses were formed, care plans and contingencies were formalized with trainee doctors, teaching was performed, and tasks were delegated. Most interviewees (n = 24) described a transition from an "in-depth" to an "ongoing" assessment phase as the day progressed, whereby they monitored the progress of patient management plans, intervened when problems arose, or adapted plans according to changing circumstances. For interview phase II, 21 senior physicians described an emergency scenario they had experienced in the ICU and described their leadership of the team. Cases focused on sudden hemorrhages, resuscitations, major surgical complications, septic shock, cardiac arrests, drug overdoses, trauma victims, and sudden influxes of patients to busy ICUs. Three interviews focused on non-ICU critical events, and one collected no second phase data (these interviews were removed from analysis of phase II data). Finally, all interviewees described the general leadership skills or behaviors they thought represented effective or ineffective team leadership.

Table 2 shows the number of statements made by senior ICU physicians that referred to behaviors within the functional leadership or team development dimensions (by interview phase). Most references were to functional leadership behaviors (76.5%).

Functional Leadership Behaviors. References to functional leadership behaviors were made during interview phases I and II (99%). Half of all 702 references (48%) were to behaviors for "managing team members." Of behaviors relating to a routine day (phase I), 29% referred to information gathering compared to 18% for critical events (phase II). References to "managing materials" accounted for just 3% of all behaviors, and this category was excluded from further analysis. Of the specific functional leadership behaviors discussed, some were described by all interviewees (e.g., delegating tasks and tailoring instructions to the skills and knowledge of trainee staff), by a subset (e.g., eight interviewees described applying prepared contingency plans in response to patient deteriorations), or by a single interviewee (e.g., thinking aloud when gathering information). Furthermore, behaviors appeared specific to phases of work, for example, developing patient plans ("planning and decision-making") during unit assessments (n = 25), checking patient plan progression ("information gathering") while monitoring the ICU (n = 22), and assuming decision-making authority ("managing team members") during emergencies (n = 14).

Table 3 synthesizes and lists the functional leadership behaviors described by senior physicians. The focus is on behaviors discussed by more than one interviewee (i.e., commonly used strategies), although behaviors discussed by a single interviewee were included if there was sufficient rationale (e.g., consistency with the leadership literature). To produce a concise list, similar behaviors were combined (e.g., the various indicators used to assess whether trainee doctors required assistance). Finally, it should be noted that the leadership behaviors in the framework are not weighted according to their prominence in the interviews, nor is the framework intended to be linear.

Team Development Behaviors. Of the 216 references to team development behaviors, 62% were made in relation to a routine day (interview phase I), and 33% were made when discussing general leadership skills (phase III). More than one-third (41%) related to behaviors aimed at establishing team norms. Virtually no references (1%) were made to behaviors for "providing organizational support" (e.g., designing official rewards systems), and this category was excluded from further analysis. Furthermore, more than 70% of references to "coaching' were also coded as belonging to the functional leadership categories of "planning and decision-making" and "managing team members" (e.g., teaching during the round). Because coaching behaviors were described as integral to leading ICU teams and were mostly captured within the analysis of functional leadership behaviors, the category was excluded from further analysis.

Senior physician references to team development behaviors focused on, but were not exclusive to, medical trainees. In analyzing behaviors used to "provide team direction," two subcategories

Table 3. Functional leadership behaviors reported by senior physicians as being used to lead intensive care unit teams

	Information Gathering	Planning and Decision-Making	Managing Team Members
Unit Assessment: Guiding the team to understand patient/unit conditions, and to develop patient treatment plans	Status/condition of new patients is assessed on arrival at the intensive care unit Expected changes in status of existing patients are confirmed Patients for potential discharge from intensive care unit are identified Patient information sources (e.g., charts, x-rays, blood tests, drug charts) are reviewed in-depth with multidisciplinary team Information on patient progression is gleaned from nursing/medical staff (e.g., drugs, feeding, sedation, discussions with family) Future information (e.g., computed tomography scan) or resource (materials, expertise) requirements/gaps are identified with team and tasked accordingly	*Ad hoc* patient management plans generated during initial walk-around Procedures or tasks that require immediate activation by team members (e.g., extubation) because of patient developments are initiated In-depth patient care plans are developed with medical/nursing teams Team member concerns are invited and discussed, and key patient treatments/investigations are outlined and prioritized Potential developments in patient progression are discussed and contingency plans are outlined When appropriate, major decisions are postponed until further information/second opinion has been received Patient management plans, key decisions, and main information points are recapped with the nursing and medical staff	Staff rotation is checked and new trainee doctors are met during initial tour The skills, knowledge, and experience levels of new trainee doctors are considered (e.g., through informal discussion, stage of training) Contributions to the patient care plans are invited from team members, and questions are invited on previously unseen illnesses/treatments Dependent on workload/team, junior trainees are asked to present cases, nurses are asked to discuss patient care, and senior trainees are asked to lead on care plans Tasks and responsibilities are delegated with instructions tailored to trainee physician skills, knowledge, experience, and training needs Team members are asked to verbally confirm their specific duties and responsibilities for each patient before next patient is reviewed Team satisfaction with patient care plan is checked
Unit Monitoring: Supporting the team in providing patient care and identifying/applying solutions to potential problems	Status/progress of priority patient treatments is monitored through visual inspections and discussions with medical and nursing staff Information sources (charts, x-rays) are periodically reviewed Patient plans with inadequate progress are identified/highlighted and discussed further with team members Problems or unexpected changes to patient conditions are detected through dialogue with medical and nursing staff Awareness for potential incoming/outgoing patients is maintained through communication with senior trainees/other units Completion of routine housekeeping/care tasks (e.g., paperwork, patient nourishment) is checked	Patient management plans are evaluated and adapted (e.g., changing treatments, conducting further tests) with senior trainee as patient conditions change Factors impeding progression of patient management plans are identified and remedial steps taken (e.g., re-establishing team priorities) Contingency plans (e.g., re-allocating team duties) are utilized in response to unexpected events/data (e.g., rapid patient deterioration) Patients are admitted and discharged according to current and likely future demands within the unit (e.g., occupancy and staffing levels) Management plans are recapped on leaving the unit	Issues/problems in enacting the care plan are discussed with team members and guidance is given on technical/organizational issues Medical trainees and nursing staff are made aware of new information on their unit or patient responsibilities (e.g., admissions, test results) Trainee doctors are observed performing difficult procedures to detect indicators (e.g., stress, distraction, nurse unease) of a need to intervene Tasks that trainees have not previously performed or those that they are struggling to perform are supervised or performed by the senior physician for demonstration and skill retention purposes Team members coordination is assessed (e.g., task duplication, information sharing) and instructions are given when necessary (e.g., re-confirming tasks, priorities, and inter-dependencies)
Crisis Management: Developing crisis management plans and providing directive leadership during emergency situations	A concise analysis of the situation from the trainee doctors/senior nurse is requested	A crisis management plan is quickly developed/adapted with the support of team members and situational overview is communicated	Decision-making authority assumed if trainee is not coping or if patient safety may be at risk (e.g., time constraints, illness complexity)

Table 3. —*Continued*

	Information Gathering	Planning and Decision-Making	Managing Team Members
	When situation is managed by a trainee physician, indicators showing need for senior physician intervention are monitored (e.g., trainee indecision, severity of illness, management plan quality) When performing tasks requiring high levels of attention (e.g., line insertion), team members are instructed to verbally update on new information (e.g., physiologic measures) Information is considered "aloud" to share and confirm (i.e., identify inconsistencies) team member perspectives Future situational/system information requirements are identified (e.g., availability of surgical support)	As required, team members opinions are sought on the management plan and alternative ideas considered if appropriate Task priorities and contingency plans are quickly communicated to the team Team members are verbally updated on changes to the management plan as the situation progresses Team members not needed to provide support are asked to focus on normal patient care duties outlined within unit management plan	Decision-making authority is asserted through clearly and appropriately delegating tasks (e.g., by seniority) and by giving precise instructions Calmness is shown in decision-making and team members are encouraged to contribute information to the decision-making process Difficulties in team members performing technical tasks are anticipated, with the senior physician being prepared to supervise or dynamically swap functions with trainees as necessary Should another team member or specialist be better suited to performing a task than the senior physician, help is requested Team members are coordinated through them confirming their task duties and providing constant updates on task progression As control is gained of the situation, decision-making is distributed back to senior trainee and nursing staff

emerged. Senior physicians described demonstrating the clinical standards expected of team members (e.g., taking responsibility for decision-making) and developing a shared perspective on the goals and vision for the unit (e.g., having senior physicians cooperate on developing unit goals) that would withstand changes in personnel. Similarly, two subcategories emerged in the analysis of behaviors to "establish team norms." Senior physicians described building expectations for teamwork that facilitated team members working well together (e.g., explaining team structures, asking team members to coordinate on information sharing) and building a positive and open relationship between team members and the senior physician (e.g., through encouraging novel ideas, not overreacting to mistakes).

Table 4 synthesizes and lists the team development behaviors used by senior physicians to create conditions that will enable team performance. The procedure used to develop the functional leadership behaviors (Table 3) was replicated, albeit with two key distinctions. First, team development behaviors were not associated with a phase of work within the ICU, and they referred to general behaviors that are demonstrated during patient care or discussions with staff (e.g., establishing/following treatment protocols), or demonstrations of attitude (e.g., asking for opinions). Furthermore, the categories of "providing team direction" and "establishing team norms" were each broken-down into the two emergent subcategories described.

DISCUSSION

Senior physicians illustrated the importance of team leadership in the ICU. Team leadership was described as a complex set of functional and adaptive (according to scenario and team) behaviors, whereby senior physicians constantly attempted to understand and interpret challenges facing the ICU team (e.g., through patient reviews, discussing patient progression), make and effectively communicate decisions regarding patient care (e.g., developing patient care plans), and manage the activities and needs of team members while prioritizing patient safety (e.g., task delegation for developing trainees, directive decision-making during crisis). Furthermore, a core function of the team leader is to develop a stable and safe environment in which a constantly changing group of team members can develop their skills and knowledge. Keys to this are senior physicians working to develop a common perspective (for team members) on the goals and expectations within the ICU and establishing a positive team culture (e.g., encouraging team members to understand their interdependencies and to contribute to patient planning).

The structured interviews found senior physicians to report using a variety of team leadership behaviors. The framework presented in Tables 3 and 4 structures these data in a manner that reflects the established two dimensions of team leadership, provides example behaviors for the behavioral categories underlying each dimension, and identifies behaviors used to lead teams during specific phases of work. The framework shows leaders to constantly adapt their leadership strategies (34). During the "unit assessment" phase, senior physicians guide team members in developing their understanding of patient conditions and facilitate the team to develop patient treatment plans. During the "monitoring phase," senior physicians provide a supportive function whereby they identify problems and assist team members in providing patient care.

Table 4. Leadership behaviors of senior physicians reported as being used to develop the underlying conditions necessary for effective team performance

Providing Team Direction	Demonstrating Clinical Excellence	Protocols and guidelines are followed, and if not an explanation is given
		Responsibility for medical decisions is taken, with trainees expected to take responsibility for their work
		Interest is shown in clinical work and also development of trainee physicians and nursing staff
		Low-level tasks are performed (e.g., notes, answering telephone) to demonstrate their importance
		Clinical competence is displayed through concisely reaching and explaining decisions on patient management
		Procedures are always performed to the highest of clinical standards
		The successful management of difficult cases are used as *ad hoc* teaching points for trainees
	Developing a Shared Perspective With the ICU Team	A unified message on the unit's goals and expectations of staff is reached between senior physicians
		Protocols and guidelines are kept up to-date, are evidence-based, reflect operational realities, and are shared with all team members
		Inconsistencies with other senior physicians on patient management strategies are avoided
		Specific goals for the ICU are developed (e.g., on patient safety, sedation, feeding)
		Broader targets for the ICU are developed (e.g., lowest standard ICU mortality rates in regional area)
		Unit successes are promoted in terms of patient care quality, safety data, goal attainment, and research
		Trainees are provided with a broader vision on the purpose of intensive care beyond the performance of technical tasks and medical training
Establishing Team Norms	Building Expectations for Teamwork	Patient safety is explicitly made key to ICU, with team members being asked and expected to work effectively and courteously together regardless of personal issues
		Team structures and hierarchical systems through which tasks are allocated and information communicated are clearly explained to trainees and nursing staff
		Trainee staff are taught to expect challenges on their decision-making by either medical or nursing staff
		Coordination and communication on task work (e.g., data sharing, resource planning) is emphasized to team members so that functions are synchronized (e.g., multiple treatments, procedures or tests)
		All team members are asked and expected to perform menial or administrative tasks
	Team Member Interactions With the Senior Physician	Formalities are clearly established to new team members (e.g., calling the senior physician by title)
		Trainee doctors are supported in contacting the senior physician when they have significant patient care concerns and are not criticized for raising false alarms
		Contributions and novel ideas from team members on unit and patient management are encouraged
		Team members are encouraged to approach the senior physician if they experience professional/personal difficulties
		When unintentional mistakes are made by medical or nursing staff, the senior physician remains calm to establish a learning culture
		Empathy and compassion is shown to the trainees, with feedback being structured into learning points

ICU, intensive care unit.

Last, during "crisis management" phases, team leaders tend to adopt a more directive approach to leadership, developing/sharing crisis management plans and delegating tasks to team members. This framework is intended to provide insight into the team leadership behaviors used by ICU team leaders. It could be used to contribute to the future development of team leadership training and assessment tools for trainee physicians and to provide a frame of reference for trainees developing leadership skills.

To validate the leadership framework, it is necessary to reflect on whether the behaviors identified are likely to influence team or patient outcomes. Although leadership is important for safety in numerous domains, only limited behavioral research has been conducted in intensive care. However, research in other healthcare domains can provide insights. For example, in surgery, anesthesia, and neonatal care, team leader information gathering behaviors for collecting data from team members, cross-checking information, ensuring that team members comprehend patient data, and identifying team information gaps are important for performance (26, 35–39). Similarly, team leader planning activities for establishing patient plans and task priorities, encouraging participation in decision-making, communicating thresholds for contingency plan application, and systematically recapping plans are also important (35, 36, 40–42). Furthermore, research with emergency medicine teams highlights the need for team leaders to delegate and tailor instructions to team member skills, develop clear team roles/structures, and delegate leadership duties to trainees when workloads are low (43–47). Leader monitoring behaviors also have been identified as crucial for ensuring safety (48, 49). Research with emergency

teams has emphasized team leaders asserting their authority, providing increased guidance for complex/novel tasks, focusing on situation assessment when arriving late, remaining calm, and delegating leadership authority as task load lessens (25, 48, 50, 51).

In terms of team leadership behaviors to develop an environment in which team members perform effectively, the behaviors captured within the framework resonate with the medical literature. For example, team leaders creating a culture of open communication, particularly for listening to trainee and nurse concerns during decision-making, is important for patient safety (11, 27, 52, 53). Furthermore, research in trauma and resuscitation units emphasizes team leaders developing clear expectations for team member behaviors, displaying a positive attitude, developing rationales for change, and setting standards for teamwork through their own cooperative behaviors (43, 54, 55). In addition, research with trauma, surgical, and ICU teams has highlighted goal setting and the development of a safe learning environment in which constructive feedback is provided (48, 56–59). Although healthcare research also has identified leader behaviors not captured in the framework (e.g., debriefing) (60), the framework structures and develops the existing healthcare leadership literature and identifies new team leadership behaviors (e.g., senior physicians collaborating to avoid inconsistencies in instructions on patient care and their behavioral expectations of staff). The interview data are also consistent with psychology research differentiating between dimensions of team leadership (1, 21), along with complementing adaptive leadership research (34, 47, 48). Finally, three of the team leadership behavioral categories (managing materials, coaching, providing organizational support) were excluded from the analysis, potentially signifying their lack of relevance to ICU team leadership.

The sample was limited to senior physicians, with the interviews focusing on the behaviors they report using to lead teams. In validating the framework, outcome data are required along with additional interviews with nurses and trainees (41). Future research will compare ICU team member perceptions of effective leadership skills and will build on informal follow-up interviews conducted with a small sample of senior trainee physicians. These interviews provided similar and additional insights to those provided by ICU specialists. For example, senior trainees described themselves as the "conduit" between the senior physicians and trainees and nurses (e.g., ensuring information is understood). They also highlighted challenges of having leadership rotated between senior physicians on a given day/week, with trainees adapting their behaviors to meet the perceived expectations of the lead ICU physician.

Semistructured interviews provide rich data, with interviewees describing behaviors and cognition in great detail; however, they do have limitations. Although interviewees were ICU experts, it is not possible to ascertain their leadership qualities. Critical incident interviews attempt to overcome this limitation by having interviewees focus on successful behaviors engaged during an event, rather than focusing on subjective opinions. However, interviewees may have recalled behaviors inaccurately (61) and focused on the aspects of their behavior they believed most important (irrespective of their actual effectiveness). The analysis attempted to reduce this limitation through focusing on behaviors recalled by several interviewees, or by interpreting behaviors using existing leadership research. It is also not possible to ascertain whether interviewees did not focus on their own behaviors, but instead discussed behaviors they expected to be important. The extent to which stated behavioral preferences and intentions (e.g., for prescribing behaviors) predict the actual behaviors of clinicians varies (62) and is considerably stronger when self-report measures (as opposed to objective measures) of behavior are used. Thus, interviewee actual behavioral engagement cannot be established and recollections may be influenced by social desirability (63) and hindsight biases (64).

CONCLUSIONS

Effective team leadership is essential for ensuring team performance and patient safety. Through applying team leadership theory and semistructured interviews, a preliminary framework has been developed to capture the team leadership behaviors reportedly used by senior physicians to facilitate effective ICU team performance. Although the framework requires validation, it provides insight into the team leadership behaviors used by ICU team leaders and can potentially contribute to the future design of ICU team leadership training and assessment tools, along with providing trainee physicians a framework against which to develop their leadership skills.

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APPENDIX 1

Team Leadership in the Intensive Care Unit: Specialist Interview Schedule

Protocol.

A. Brief the participant on the purpose of the project and interview.
B. Describe the nature of the interview (i.e., that it is recorded) and discuss confidentiality.
C. Describe the format of the questions. The first set of questions will refer to specialist reflections on leadership in the intensive care unit (ICU) during a typical day. The second set will refer to a challenging incident in the ICU and the leadership behaviors shown to guide the team. The third set will refer to leadership in general within the ICU.
D. Clarify the participant's view on who is in the "ICU team" and on the structure of the team.

Question Set 1. Please recall and describe a typical day in the ICU when things went well, focusing on the key decisions that were made. Interviewer prompts:

1. What was your role?
2. How were patient treatment plans developed?
3. How were tasks distributed?
4. Did you have expectations for how the team would function?
5. How do you know if the team is performing well?
6. Are there factors that indicate a team, or individual, to have difficulties of some form?
7. Should problems arise, how would you guide the team?
8. Does the specialist registrar/fellow have a leadership role in the ICU?
9. What expectations do you have for how the specialist registrar/fellow will interact with nurses and more junior doctors?

Question Set 2. Please describe an event in the ICU when things were highly challenging and the team had to function extremely well to meet the needs of patients. Interviewer prompts:

1. What was your role?
2. Who was on the team, and what was the structure?
3. Can you describe how the team performed?
4. Was the performance of the team influenced by the team leader?
5. Did you behave the same as you would on a normal day?
6. What was communication like between team members?
7. What was the role of the specialist registrar/fellow?

Question Set 3.

1. What leadership skills and behaviors do you think are essential for effectively leading ICU teams?
2. Are there styles/behaviors that lead to teams performing less effectively?