Air Medical Journal 000 (2022) 1–5

Contents lists available at ScienceDirect

Air Medical Journal

journal homepage: http://www.airmedicaljournal.com/

Featured Article

A Framework for Case-Based Learning in Prehospital Medicine: The London's Air Ambulance Experience

Luca Carenzo, MD [1,2,*], Chloe Baker, MD [2,3], Steve Jones[4], Tom Hurst, MD [2]

[1] Department of Anesthesia and Intensive Care Medicine, IRCCS Humanitas Research Hospital, Rozzano, Milan, Italy
[2] London's Air Ambulance, London, United Kingdom
[3] Royal London Hospital, Barts Health National Health Services Trust, London, United Kingdom
[4] London Ambulance Service National Health Services Trust, London, United Kingdom

A B S T R A C T

Clinical governance is the framework around which health care organizations can maintain a higher standard of safety and care. One of the central aspects of clinical governance is continuous professional education, including case-based review and case-based learning. In this article, we present the case-based education process in use at London's Air Ambulance, a mature advanced prehospital system in London, UK. The case review process begins with an on-scene hot debrief, an informal process often involving other emergency services. This is usually followed by internal team feedback and debrief and patient follow-up. All cases are then reviewed over the next 24 to 48 hours by the duty prehospital consultant (attending) in the rapid review process. After this, certain cases are volunteered or selected for discussion in the twice weekly death and disability (D&D) meeting or the monthly dispatch meeting. A small subset of cases is highlighted through this process for full formal audit and presentation at the monthly clinical governance meetings based on their educational value. Another subset of cases involving a fatality is also discussed at the monthly clinical pathology correlation meeting with the input of local forensic pathologists. Organization of the process, structure of the meetings, and educational value are described in detail.

London's Air Ambulance (LAA) is a physician-paramedic advanced prehospital system operating in the London urban area that serves an area of approximately 6,731 km^2 and a daily population of around 12 million, considering commuters and visitors. The team, consisting of a specially trained physician and paramedic, is active 24 hours every day, traveling to patients via helicopter or rapid response cars. The aim is to deliver advanced critical care to the roadside with commonly performed interventions including prehospital anesthesia; analgesia and sedation[1,2]; blood product administration[3]; reversal of anticoagulants; and a wide array of surgical and endovascular resuscitative maneuvers such as thoracostomies, thoracotomies,[4] and prehospital resuscitative endovascular balloon occlusion of the aorta.[5,6]

As a standard of care, all cases attended by LAA are debriefed and reviewed for educational and governance purposes. The idea behind this process is to foster individual, team, and institutional learning through discussion. The aim of this article was to simply describe the case review process at LAA and its implication on shared team learning and clinical governance, with the intention to present a consolidated educational system that can be of inspiration or interest to other prehospital systems around the world.

Principles

LAA centers its activities around the concept of clinical governance. Clinical governance can be defined as the framework through which health care organizations are accountable for continuously improving the quality of their services and safeguarding high quality of care.[7] Very limited literature is available about clinical governance in prehospital care.[8-10] Recent projects in this field have involved critical incident monitoring[11] and the development of an electronic debriefing tool.[12] In his work on case-based learning in medical education, Williams concludes that no parallel research was found in the area of prehospital education.[13] To the best of our knowledge, this is

We would like to thank all London's Air Ambulance staff members who over the years contributed to designing, shaping, and refining the service clinical governance framework.

*Address for correspondence: Luca Carenzo, MD, Department of Anesthesia and Intensive Care Medicine, IRCCS Humanitas Research Hospital, via Manzoni 56, 20089 Rozzano, Milan, Italy.
E-mail address: luca.carenzo@hunimed.eu (L. Carenzo).

1067-991X/$36.00

https://doi.org/10.1016/j.amj.2022.09.005

the first article addressing in detail the topic of case review for learning and governance in this setting.

Central to the design of our case review process are the core values of the organization—to be compassionate, courageous, and pioneering. Our aim, as embedded in our governance guidance, is "to achieve the fullest possible understanding of every case through open and rigorous discussion, for the benefit of future patients, always remembering our colleagues involved in the mission were trying to achieve the best for the patient in the circumstances they encountered, with the training and tools they had been given." It is emphasized to our teams that the learning sought by this process is at multiple levels, from the individuals involved to our training and system-level procedures and beyond. Indeed, the benefits of the case review process can extend through the organization to the executive board, charity board, London's Ambulance Service, and the hospitals within our trauma network.

In order to extract maximum learning from every mission, it is important that all discussions take place in an environment of psychological safety.[14] Psychological safety is at the basis of a just culture; Tucker et al[15] described it as a "supportive work unit in which members believe that they can question existing practices, express concerns or dissent, and admit mistakes without suffering ridicule or punishment." The team must feel safe to take interpersonal risks and be vulnerable in front of one another. Fundamental in maintaining this facilitative culture is the presumption of positive intent.[16] This means a presumption that everyone working in the service is striving to do their best for every patient. Clinicians taking part in the review process are also reminded to be mindful of the effects of hindsight or outcome bias[17,18] whereby our view on our colleagues' actions is inevitably affected by knowing the outcome of their actions. Consideration toward the effects of outcome bias and an awareness of the importance of reviewing our colleagues' work with respect and care help the team remain open and reflective.

In broad terms, the case review process begins with an on-scene hot debrief, an informal process often involving other emergency services. This is usually followed by internal team feedback and debrief and patient follow-up. All cases are then reviewed over the next 24 to 48 hours by the duty prehospital consultant (attending) in the rapid review process. After this, certain cases are volunteered or selected for discussion in the twice-weekly disability and death meeting or the monthly dispatch meeting. A small subset of cases is highlighted through this process for full formal audit and presentation at the monthly clinical governance meetings based on their educational value. Another subset of cases involving a fatality is also discussed at the monthly clinical pathology correlation meeting with the input of local forensic pathologists. These steps are all described in detail later.

On-Scene Hot Debriefing

The initial case review process starts on scene with an informal debrief involving the whole team who attended the job. In most cases, the team will gather with other professionals from LAA (ie, paramedics, technicians, team leaders, and incident response officers) in the back of 1 of the ambulances or outside the emergency department, just after having handed over the patient to the receiving hospital. If a patient has sadly died on scene, the debrief will happen on scene after all the family conversations and bereavement procedures have taken place. In the latter case, members of other agencies on scene (eg, the London Fire Brigade or the Metropolitan Police Service) are also invited to participate because debriefing principles are to be inclusive and multidisciplinary. In case of violent events (such as stabbings and shootings), the participation of armed police is of great benefit because their team will often be the first to have seen the patient on scene and possibly the only ones to have seen the patient before further deterioration.

The London Ambulance Service (LAS) incident response officer or the LAA physician or paramedic will lead the debriefing in cooperation with one another. Leading a hot scene debrief is a skill every LAA team member is expected to master and be able to effectively deliver during their sign-off period, the proficiency of which will be scrutinized during sign-off.

The structure of the hot debrief is flexible; however, a commonly followed pattern is as follows: first of all, a recollection of events is performed in a chronological fashion starting with the members first on scene speaking (first arrived and first speak) followed by positive feedback using a methodology similar to the delta/plus feedback system (positive aspects and improvement aspects),[19] and then feedback and questions regarding rationale and objectives for LAA interventions are sought. The debrief at this stage is largely technical and usually completed with welfare checks and signposting for recognizing signs of psychological anguish and advice regarding seeking help. The importance of the welfare conversation is clear after very violent jobs or those involving pediatric cases; however, any job can present different emotional challenges to members of the team on scene, and this is often not obvious nor remediable immediately. Therefore, it is strongly encouraged to debrief all cases in this manner in order to maintain good practice and protect the wider team.[20] It is important to consider the debriefing as protected time for the ambulance service because it provides a break after stressful jobs for the crews and offers a welfare moment to reduce overall mental fatigue through the shift.[21]

Internal Team Feedback and Debriefing

LAA teams also conduct their own debrief after every job. These debriefs involve the fire crew and pilots when the team has traveled to the scene via helicopter. The focus of this debrief will vary depending on the dynamics of the job and will often involve a "2 good points, 2 points to improve" structure to keep the process short and focused and maximize engagement. A more in-depth clinical conversation may then take place thereafter. Debriefing after clinical events provides opportunities to define and discuss gaps in medical knowledge, clinical performance, and behaviors that directly relate to patient care.[22] Pre–sign-off doctors and paramedics are expected to collect written notes for debriefing of every case they attend and present this portfolio on sign-off day.

Patient Follow-Up

All clinicians are encouraged to personally and actively follow up with their patients. This is associated with a wider aim of LAA, which is embodied by the patient liaison nurse,[23] to support and guide patients and their families through the (often lengthy) journey of recovery and rehabilitation after major trauma.[24] However, in terms of learning, it is vital that clinicians review the accuracy of their initial diagnosis and any potential additional injuries and learn to correlate their findings based on mechanism and clinical examination.

Patient follow-up can broadly be split into 3 phases: immediate follow-up, clinical follow-up, and long-term follow-up. Immediate follow-up is performed 1 to 2 hours after handing over the patient to the hospital. Each clinician is expected to record immediate follow-up and progress for each treated patient. Long-term follow-up, which includes in-person visits to the patient while in the hospital and at home, is facilitated by the patient liaison nurse along with the treating clinical team.

Rapid Review

Rapid review is an internal, technical process that is completed on a daily basis by the duty consultant. Missions completed within the previous 24 hours are summarized, and the associated paperwork (patient records, observations, etc) is reviewed. This is a consultant-led process supported by the wider clinical team, including registrars

Table 1
Rapid Review Template

Dispatch	• Timing
	• Communication
	• Any other business
Fire crew	• Enplaning
	• Deplaning
	• Communication
	• Any other business
Pilots	• Dispatch
	• Takeoff
	• Flight
	• Landing
	• Communication
	• Any other business
Driving standards	• Route
	• Driving
	• Any other business
Medical	• Job
	• Treatment
	• Communication
	• Triage
	• Follow-up
	• Provisional Injury Severity Score
	• Any other business
Records	• Documentation (patient record fully completed and legible)
	• Safeguarding
	• Any other business

on administrative duties, the pilots, and fire crew. Occasionally, there are too many clinical activities to allow this to happen; on these occasions, the missions are reviewed the following day.

Rapid review is a structured process. The components reviewed during rapid review are presented in Table 1. A brief summary of the dispatch, job cycle times, team, and clinical findings and management is delivered by the registrar along with the patient run sheet, a copy of the vital signs, and the available follow-up. This is supplemented by a review of the journey to the scene. Where this is a drive, the helipad team uses car tracking and video/sound analysis to describe the route planning and quality of blue light driving.[25] Alternatively, the pilots are invited to comment on the lift time, the journey to the scene, the landing site in terms of appropriateness (at least twice the size of the aircraft), and the proximity to the scene (alpha < 50 m landing to patient, bravo between 50 and 200 m, and charlie > 200 m).

The patient record (run sheet) and annotated observations are reviewed for an insight into the nature of the clinical job, the completeness of the documentation, and any concerns with regard to safeguarding or team welfare. Safety, quality, or welfare concerns raised by this process can trigger a one-to-one conversation with the team involved. More commonly jobs are highlighted to be reviewed in the formal D&D process on the basis of interest in terms of patient presentation, clinical diagnosis, interventions performed by the team, missed injuries, or other crew resource management or clinical challenges.

D&D

The D&D meeting takes place twice a week at fixed times and is led by an LAA consultant. Cases are selected for D&D via the rapid review process or can be volunteered by the clinical teams involved or selected randomly. Members of the wider prehospital team (London Ambulance Service) or the in-hospital team (eg, trauma team leader) are invited for specific cases to give a wider context to the discussion and share learning.

The D&D process involves a deeper dissection of the selected cases, exploring the thought process of team members and reasoning behind individual and team decision making at any stage of the job. Table 2 outlines the process of a typical D&D meeting; the essence of D&D is described by Goodsman and Wong's ethnographic work as follows: "In medicine generally an individual's clinical reasoning is not usually shared, let alone as a matter of course (unless something has gone wrong). D&D serves as an opportunity for clinicians to discuss the cases and situations they encountered and hear what others might have done in the same position – potentially towards supporting (or refuting) their clinical actions and also enabling them individually and jointly to reflect on their practice."[26]

Table 2
Structure of Death and Disability Meeting

1. Team introductions if needed
2. Selection of cases by facilitator (can be requested by attendees); cases needing discussion as defined by teams involved or rapid review process or picked at random from database. Usually discuss 1 to 2 cases in detail or several more briefly.
3. The team responsible for the case describes the context of the job (including other activities/incidents that day if relevant) and their experience of managing the case
4. The facilitator may pause the description at any time to open discussion of specific points of interest to the wider team or explore alternative explanations, differential diagnoses, or management options.
5. Follow-up of the case is usually presented toward the end of this discussion and may then be followed by further exploration.
6. Finally key learning points and where needed action points (eg, standard operating procedure revision and feedback to other services) are documented.

D&D could appear to be a delicate process because topics can be emotive and provoke animated discussion; however, all team members fully understand that the process is an essential component of learning and as such is a normal part of standard practice. Through respecting the principles described earlier and frequent attendance at meetings, most clinicians report a positive and often cathartic learning and processing experience. For attendees not involved in the cases discussed, the meeting represents a vital source of learning and has been recognized as a means of significantly enhancing and extending clinical exposure during the secondment. All meetings are minuted with the case, discussion, and learning and action points and disseminated to the wider team.

Every effort is made for the entire team to be present when cases are discussed. The case is presented in a step-by-step fashion (Table 2). The "scene is set" through describing the dispatch process, the clinical information available to the dispatcher and team, the clinical team's journey to the scene (including landing and driving concerns), the initial scene including any safety concerns, and the handover from the resources already present managing the patient. Relevant information from the wider shift activities may also be added to give context to subsequent events. The teams' initial impressions (doctor and paramedic), findings of the primary survey, the plan as discussed, and subsequent actions and interventions are then described. Triage decisions, the journey to the hospital, reception, and handover of the patient and subsequent computed tomographic imaging and clinical management are also given. The consultant leading the meeting will often choose to focus on specific areas in which maximum learning is available and may pause the narrative at times to gather the impressions or questions from the wider team present.

Cases presenting particular difficulties, clinical presentations of interest, recurring themes, excellence in terms of diagnosis or management, significant omissions or errors, or other opportunities for wider learning can be highlighted for further analysis on clinical governance day.

Besides presenting important learning for individuals, the wider team, and the institution, these meetings also present a vital step in processing difficult cases for the individuals involved. This can include cases in which doubts exist over technical or diagnostic skills, unexpected poor outcomes, or very violent or otherwise emotive jobs. As such, attendance at the meetings is an important factor in safeguarding the psychological well-being of the team.

Table 3
Longitudinal Case Audit Template

Item Audited	Green (Fully Compliant)	Amber (Partially Compliant)	Red (Not Compliant)
Aircraft, vehicle, and helipad daily checks	• All daily checks completed and fully documented	• Minor deficiency	• Major deficiency or well below standard
Dispatch	• Dispatch performed within time frame as per SOP • Dispatch tasking log completed in full • RVP/safety issues correctly addressed	• Dispatch outside time limits but explained by narrative and with no patient impact • Dispatch log below standard • Nonstandard dispatch or other concern	• Significant delay with actual or likely patient impact • Mission missing from dispatch tasking log
Fire crew	• No delays in dispatch, no safety related incidents, no equipment deficiencies, no training deficiencies, incident-free transfer from aircraft to lifts during carryback	• Minor equipment deficiencies • Unusual off-load or patient transport • Issue with lifts	• Helipad unavailable • Major equipment deficiencies • Serious incident involving fire crew, patient offload, or lifts
Aviation	• Airborne ≤ 4 minutes • Tech log complete • Landing site closest • 2d+ landing site	• Airborne > 4 minutes • Items missing from tech log entries • Not closest 2d site unless clear explanation • Minor third-party damage	• Missing tech log or incorrect calculations • < 2d landing • Injury or aircraft damage
Driving	• Moving ≤ 4 minutes from dispatch • Appropriate route • Few if any apparent navigation errors • Driving standards: speed and style appropriate	• > 4 minutes from dispatch • Navigation or route error (ie, not best route to destination)	• Wrong destination or major navigation error • Significant concern regarding driving speed or style • Vehicle driven with defect
Operational safety and communication	• Scene management safe and in-line with SOP • Communications in-line with SOP • Operational approach sound	• Areas for discussion or concern	• Unsafe scene management • Major communication error impacting patient care or safety • Operational approach poor
Medical: injuries, interventions, and adherence to standard operating procedures	• Injuries identified and appropriately addressed • All interventions appropriate and timely • SOPs complied with and appropriate	• Concern regarding significant injury that might have changed treatment • Missed or inappropriate intervention • SOP not followed or needs review	• Missed injury with harm • Inappropriate or unsafe intervention • SOP inadequate or unsafe or major SOP violation
Documentation (patient record, observation charts, blood form, and follow-up form)	• Describes injuries and treatment accurately • All boxes complete and legible	• Minor omission or lack of clarity	• Does not meet GMC standards • Major omission, inaccuracy, etc
Follow-up	• Patient follow-up documented including clinical course, injury list, CT results, and outcome	• Some patient follow-up, just a list of injuries where clinical course should have been established	• No patient follow-up or major concern
SMS filed (if appropriate)	• No SMS needed or SMS needed and completed in a timely fashion	• Issue that SMS could have been beneficial but not done or SMS very late	• Significant issue not reported

2d = twice the size of the aircraft; CT = computed tomographic; GMC = General Medical Council (UK licensing authority); RVP = rendezvous point; SMS = safety management system; SOP = standard operating procedure.

Dispatch D&D

An LAA paramedic is stationed in the emergency operations center 24 hours a day in order to identify calls that might benefit from LAA intervention. A specialist version of D&D is the dispatch-centered D&D meeting. This meeting is usually run once every 2 months or when needed. Cases are specifically flagged for this meeting during rapid review or directly by the duty dispatch paramedic or the lead paramedic. Dispatch D&D is the technical dissection of the emergency call and dispatch process, which is audited against the technical guidance and assessed against the clinical outcome.[27] Delayed cases with immediate criteria for dispatch, cases with an usually long dispatch time (> 7 minutes from call origin time with no clear explanation), unusual dispatch processes, or complex interagency communication are reviewed. In the rare event that the process highlights a low category call that had a high injury load requiring advanced treatments from LAA, the call can be referred to the LAS quality assurance process in order to identify whether system change or focused coaching could be of benefit. At dispatch D&D, the call log file is reviewed in depth, and when available GoodSAM use and call tapes are listened to.[28]

Clinical Governance Day

Clinical governance days take place on a monthly basis and are organized by a registrar and paramedic supervised by a consultant. They usually have specific themes relevant to prehospital medicine (eg, burns, head injuries, or human factors) and feature at least 1 guest speaker. They are attended by the whole service, including the charity team behind LAA, and are usually open to guests from the LAS, local major trauma centers, and other air ambulance services. Strict information governance standards are expected of all attendees.

Three cases are selected for audit and presentation on every clinical governance day. Each case will be reviewed in detail by a registrar (resident physician) and paramedic team who will audit them against specific criteria (Table 3). Audit includes the dispatch process, the journey to the scene, clinical findings, interventions, and follow-up. The driving standards manager is asked to review the route chosen and driving quality, whereas the pilots present any jobs involving the helicopter. The quality and completeness of the paperwork are discussed, and adherence to relevant standard operating procedures (SOPs) is analyzed. The resulting discussion can include operational and clinical learning points as well as provide the basis for ongoing service improvement, including modifying or updating training, equipment, or SOPs as indicated. This is the basis for institutional learning.

The themes of jobs selected for the clinical governance day will often dovetail with the overall theme of the day and be complemented by expert presentations on specific clinical presentations, technical skills, or related areas of interest. Outcomes from the ensuing discussions can often lead to SOP development, kit review, focus for clinical skills training sessions, or reflection on LAA's interaction with other agencies or receiving trauma networks.

Clinical Pathology Correlation Meeting

The clinical pathology correlation meeting is organized on a monthly basis by the golden hour fellow as part of an ongoing project looking into the causes of death in trauma. It represents an important collaboration with local forensic pathologists who provide information regarding the cause of death from the available forensic reports for patients attended by LAA as well as more generalized teaching with regard to the correlation between the mechanism of injury, the clinical presentation, and the cause of death. These meetings are widely attended by the clinical team and provide an excellent opportunity to discuss difficult cases and reflect on opportunities for intervention in the most severely injured cohort of patients. The meetings also frequently present areas for further investigation and work by the organization.

Conclusions

The case review process at LAA is a central component of our clinical governance. It is a multistaged process allowing in-depth review of clinically or technically important or challenging cases, providing a wealth of individual and institutional learning. It is vital to the service's ongoing improvement as well as providing an important component in protecting the well-being and psychological health of the team. Finally, it is a comprehensive process supported by data suggesting that including clinical teaching (as case-based discussion) in continuing professional development can be beneficial to providers' clinical performance.[29]

References

1. Crewdson K, Lockey D, Voelckel W, et al. Best practice advice on pre-hospital emergency anaesthesia & advanced airway management. *Scand J Trauma Resusc Emerg Med*. 2019;27:6.
2. Carenzo L, McDonald A, Grier G. Pre-hospital oral transmucosal fentanyl citrate for trauma analgesia: preliminary experience and implications for civilian mass casualty response. *Br J Anaesth*. 2022;128:e206–e208.
3. Rehn M, Weaver AE, Eshelby S, Røislien J, Lockey DJ. Pre-hospital transfusion of red blood cells in civilian trauma patients. *Transfus Med*. 2018;28:277–283. https://doi.org/10.1111/tme.12483.
4. Lockey DJ, Lyon RM, Davies GE. Development of a simple algorithm to guide the effective management of traumatic cardiac arrest. *Resuscitation*. 2013;84:738–742.
5. Sadek S, Lockey DJ, Lendrum RA, Perkins Z, Price J, Davies GE. Resuscitative endovascular balloon occlusion of the aorta (REBOA) in the pre-hospital setting: an additional resuscitation option for uncontrolled catastrophic haemorrhage. *Resuscitation*. 2016;107:135–138.
6. Ter Avest E, Carenzo L, Lendrum RA, et al. Advanced interventions in the pre-hospital resuscitation of patients with non-compressible haemorrhage after penetrating injuries. *Crit Care*. 2022;26:184.
7. Macfarlane AJR. What is clinical governance? *BJA Educ*. 2019;19:174–175.
8. Robertson-Steel I, Edwards S, Gough M. Clinical governance in pre-hospital care. *J R Soc Med*. 2001;94(suppl 39):38–42.
9. Nutbeam T. Clinical governance and prehospital care in the UK. *Emerg Med J*. 2011;28:91–92.
10. Kennedy M, Elcock M, Ellis D, Tall G. Pre-hospital and retrieval medicine: clinical governance and workforce models. *Emerg Med Australas*. 2017;29:467–469.
11. Stella J, Davis A, Jennings P, Bartley B. Introduction of a prehospital critical incident monitoring system—pilot project results. *Prehosp Disaster Med*. 2008;23:154–160.
12. Donald M, Paterson B. Introduction of an electronic debrief and governance tool in prehospital care. *Emerg Med J*. 2007;24:363–366.
13. Williams B. Case based learning—a review of the literature: is there scope for this educational paradigm in prehospital education? *Emerg Med J*. 2005;22:577–581.
14. Scott-Cawiezell J, Vogelsmeier A, McKenney C, Rantz M, Hicks L, Zellmer D. Moving from a culture of blame to a culture of safety in the nursing home setting. *Nurs Forum*. 2006;41:133–140.
15. Tucker AL, Nembhard IM, Edmondson AC. Implementing new practices: an empirical study of organizational learning in hospital intensive care units. *Manage Sci*. 2007;3:894–907.
16. Sikka R, Morath JM, Leape L. The Quadruple Aim: care, health, cost and meaning in work. *BMJ Qual Saf*. 2015;24:608–610.
17. Roese N, Vohs KHindsight bias. *Perspect Psychol Sci*. 2012;7:411–426.
18. Boyd D. Innovators: beware the hindsight bias. Available at: https://www.psychologytoday.com/gb/blog/inside-the-box/201508/innovators-beware-the-hindsight-bias. Accessed May 16, 2021.
19. Cheng A, Eppich W, Epps C, Kolbe M, Meguerdichian M, Grant V. Embracing informed learner self-assessment during debriefing: the art of plus-delta. *Adv Simul (Lond)*. 2021;6:22.
20. Gray SH, Lauria MJ, Hicks C. The mindset of the resuscitationist. *Emerg Med Clin North Am*. 2020;38:739–753.
21. Gilmartin S, Martin L, Kenny S, Callanan I, Salter N. Promoting hot debriefing in an emergency department. *BMJ Open Qual*. 2020;9:e000913.
22. Mullan PC, Kessler DO, Cheng A. Educational opportunities with postevent debriefing. *JAMA*. 2014;312:2333–2334.
23. Kirby K, Caswell K, Petheram J, Hyde P, Crouch R. Mapping the patient and family liaison role in UK helicopter emergency medical services: a service evaluation. *Air Med J*. 2022;41:458–462.
24. West A, Hoffman K. Patient perception of recovery following severe trauma: experience from a trauma follow-up clinic. *Scand J Trauma Resusc Emerg Med*. 2014;22:P11.
25. Rehn M, Davies G, Smith P, Lockey DJ. Structure of rapid response car operations in an urban trauma service. *Air Med J*. 2016;35:143–147.
26. Goodsman D, Wong T. Death and disability meetings at London's Air Ambulance: working in a just culture. In: Murray E, Brown J, eds. *The Mental Health and Wellbeing of Healthcare Practitioners: Research and Practice*. Hoboken, NJ: John Wiley & Sons Ltd; 2021.
27. Wilmer I, Chalk G, Davies GE, Weaver AE, Lockey DJ. Air ambulance tasking: mechanism of injury, telephone interrogation or ambulance crew assessment? *Emerg Med J*. 2015;32:813–816.
28. Ter Avest E, Lambert E, de Coverly R, et al. Live video footage from scene to aid helicopter emergency medical service dispatch: a feasibility study. *Scand J Trauma Resusc Emerg Med*. 2019;27:55.
29. Lockyer JM, Hodgson CS, Lee T, et al. Clinical teaching as part of continuing professional development: does teaching enhance clinical performance? *Med Teach*. 2016;38:815–822.