Debriefing in the Emergency Department After Clinical Events: A Practical Guide

David O. Kessler, MD, MSc*; Adam Cheng, MD; Paul C. Mullan, MD, MPH

*Corresponding Author. E-mail: dk2592@cumc.columbia.edu, Twitter: @y2kessler.

One vital aspect of emergency medicine management is communication after episodes of care to improve future performance through group reflection on the shared experience. This reflective activity in teams is known as debriefing, and despite supportive evidence highlighting its benefits, many practitioners experience barriers to implementing debriefing in the clinical setting. The aim of this article is to review the current evidence supporting postevent debriefing and discuss practical approaches to implementing debriefing in the emergency department. We will address the who, what, when, where, why, and how of debriefing and provide a practical guide for the clinician to facilitate debriefing in the clinical environment. [Ann Emerg Med. 2015;65:690-698.]

A podcast for this article is available at www.annemergmed.com.
Continuing Medical Education exam for this article is available at http://www.acep.org/ACEPeCME/.

CASE STUDY

You are working in the emergency department (ED) and a mother rushes in screaming with her pale child. The child is taken to the resuscitation room, intubated, and transferred to intensive care. Your resident asks whether the team should debrief. You have debriefed in simulation but never after an actual resuscitation. You decide to conduct a debriefing. What does debriefing in the clinical setting entail and where should you and your team begin?

INTRODUCTION

Debriefing is a "facilitated or guided reflection in the cycle of experiential learning."[1] Debriefing performance in the field was first promoted by military teams, but was soon co-opted by other high-stakes industries such as aviation and more recently medical teams.[2-4] The purpose of debriefing in health care is to facilitate discussion of actions and thought processes, encourage reflection, and ultimately assimilate improved behaviors into practice.[5]

Debriefing is a powerful quality and educational tool that can potentially change team behavior and positively influence patient outcomes. In a meta-analysis of team-based debriefings after clinical events, there was improved effectiveness in teams that debriefed compared with those that did not.[6] After clinical cardiopulmonary resuscitation events, debriefing programs have demonstrated improved rate of return of spontaneous circulation, neurologic outcomes, hands-off compression times, and time delay to first compression.[7-10] Accordingly, the 2010 American

Heart Association resuscitation guidelines officially recommend the use of debriefing after resuscitations to improve clinical performance.[11]

Despite the evidence, debriefing implementation in the ED is variable. Two surveys were conducted that queried ED providers (US pediatric emergency medicine fellows in one; Canadian emergency physicians and nurses in the other) to recall the frequency of debriefing after resuscitation events in their ED environments. The majority of respondents in both surveys indicated that they debriefed after less than or equal to 25% of ED resuscitations.[12,13] The majority of health care providers recognized the importance of debriefing and desired a structured debriefing program; however, insufficient time, lack of trained facilitators, and lack of a debriefing setting were cited as barriers to implementation.[12]

A practical structure for debriefing after clinical events can capitalize on the rich learning opportunities unique to this often-chaotic environment. In this article, we conduct an ad hoc review of the current evidence supporting team debriefing in the ED and discuss practical approaches to implementing debriefing. We will provide a practical guide for the who, what, when, where, why, and how of debriefing in the ED (Table 1).[14]

WHY?

The function of debriefing is to identify areas of optimal and suboptimal performance and then determine ways to improve future team performance. The ultimate focus of debriefing should not be on blaming individuals but on

Table 1. Guide to creating a debriefing program in the ED.

Category	Strategy
Who	**Determine the facilitator**
	Internal vs external team member
	Single vs multiple
	Trained vs untrained vs scripted guidelines
	Onsite vs remote
	Determine the participants
	Team members with or without external participants
	Trained vs untrained vs scripted guidelines
What	**Decide what events will trigger debriefings**
	Eg, trauma cases, intubations, poor outcomes, cardiac arrests
When	**Determine timing**
	Eg, hot (immediate) vs warm (delayed minutes to hours) vs cold (delayed days to weeks)
	Select criteria for a hybrid approach
	Eg, patient death with a warm debriefing and follow-up cold debriefing
Where	**Select a location to debrief**
	On site in the location where the event occurred
	On site in a location not where the event occurred
	Off site (not in the ED)
Why	**Determine the objectives for debriefing**
	Eg, improve future performance (individual, team, system), improve specific ED metrics, evaluate environment
How	**Create a standardized format for all debriefings**
	Overview of purpose, ground rules, and format
	Define a debriefing method
	Consider the use of a debriefing tool or script
	Consider the use of adjuncts (eg, video, quantitative data)
Postdebriefing	**Determine documentation methods to capture debriefing content**
	Determine who will address modifiable issues discussed in debriefings
	Determine how to close the loop with debriefing participants on actions taken
	Determine local resources available for staff for psychological distress
Promoting debriefing	**Determine your multidisciplinary local debriefing champion(s)**
	Determine a tracking method to track adherence to debriefing triggers
	Engage ED and hospital leadership to receive their support for debriefing
	Determine methods to spread debriefing throughout your hospital

taking a look at all available facts and perspectives that will help improve processes and patient outcomes. The quality of future performance can potentially be improved by incorporating a number of quality improvement processes into the debriefing (Table 2).

For individuals and teams, recognizing and understanding the contributions to an error (ie, an abbreviated root-cause analysis) is a vital step toward correcting this behavior.[15] Individuals and teams benefit from the group's reflection on knowledge, attitudes, skills, or teamwork behaviors exhibited

during a clinical event. Identifying barriers or facilitators of performance can provide feedback to administrators from frontline providers on latent safety threats. These administrators can then investigate methods to improve the process-level (eg, trauma protocol) or system-level (eg, restructure scheduling) activities in the ED. Structured debriefing should be distinguished from defusing, whose sole purpose is venting emotions to reduce tension. Debriefing takes the additional step of conceptualizing ways to improve future performance.[16-18]

WHAT?
What Clinical Events Should Trigger a Debriefing in the ED?

Simulation-based education typically includes a structured debriefing, with learning objectives based on the nature of the simulation.[11,19-22] Conversely, in the ED, the nature and timing of critical events are unpredictable, making the trigger for debriefing a complex decision process.[13] Standardization of which clinical events to debrief can enable team members to anticipate a debriefing, align departmental goals, and increase debriefing frequency.

Selection of the appropriate clinical events to debrief should be driven by local needs and priorities (Table 3). Most current evidence surrounds the high-yield effect of debriefing after cardiac arrest.[5,7-9] However, other critical events, dysfunctional interpersonal interactions, or even common problems in noncritical patients provide opportunities to debrief for educational and quality improvement purposes. For example, debriefing cases of septic shock could allow team-based reflection on process metrics (eg, time to fluid administration and antibiotics), with the proximate goal of improving guideline compliance and ultimately sepsis outcomes. In a new debriefing program, one should select triggers that occur frequently enough to promote incorporation into the culture of the ED but not so common that it becomes an overwhelming time burden. Most important, events that are debriefed must be relevant to staff. Forming an interprofessional group of stakeholders to help determine the triggers for debriefing can help with buy-in.

What Content Should Be Discussed During a Debriefing to Best Enhance Clinical Care in the Future?

The focus of debriefings should be on individual, team, process, or system issues that, if modified, would benefit the next patient with a similar presentation. Specific content discussed during debriefings can include clinical management (eg, adherence to protocols or standards), technical skills (eg, chest compressions), teamwork, and

Table 2. Processes within clinical debriefing and expected targets for improvement.

Potential Processes Within Debriefing	Targets for Improvements				Examples
	Individual	Team	Process	System	
Self-improvement and self-assessment	✓				Physician identifies a knowledge gap (eg, wrong vasopressor choice)
Performance analysis of specific metric(s)	✓	✓	✓	✓	Time to intravenous fluids and antibiotics for all septic shock patients is reviewed by team
Root-cause analysis after a suboptimal outcome	✓	✓	✓	✓	After wrong dose of epinephrine is given, a debriefing is conducted solely to determine root cause of this action
Mental model sharing across disciplines	✓	✓	✓	✓	Joint debriefing after a major trauma is conducted so that both disciplines can agree about how it was handled and how it could be done differently
Examinations of efficiency, cost-effectiveness, lean analysis, human factors			✓	✓	After 4 chest tube kits are opened for a trauma patient, the team debriefs about how the kits are organized, where they should be located, and which parts can be reused
Environmental assessment for latent safety threats			✓	✓	After team reports that they could not find the proper size chest tubes, a question about finding proper supplies is added to each future clinical debriefing session

behavioral issues.[5,7,8,21,23-25] In discussing the system, it is useful to reinforce good processes that lead to resiliency of a team's performance. Metacognition is the act of reflecting on the cognitive tasks of an individual. Bringing discussion of metacognition into debriefing may be useful to help teams understand one another's frames of thinking around medical management. It is important to be mindful of the information that team members will have available during a debriefing. Most programs will rely on the memory of participants to guide discussion. Teams may therefore be at risk of bringing inaccurate information into a debriefing (eg, attending physician: "Surgery was never contacted."). One advantage of team debriefing, therefore, is to leverage the team's collective knowledge for a more accurate account of events (eg, nurse: "Actually, we paged surgery twice, but they were in surgery.").[6] The use of objective data, such as code sheets or electronic health records, data captured by a defibrillator, or video review of clinical events, may serve as the basis of discussion and reflection during debriefing. For select cases (eg, cases of high-risk injury or preventable deaths), a detailed root-cause analysis may need to be conducted at a different time to permit a closer examination of causes than an abbreviated clinical debriefing may allow.

WHO?
Debriefing Participants

Who should participate in the debriefings? All team members who actively participated in the clinical event should be invited to participate in the debriefing.[26] In the study by Mullan et al,[5] multiple team members were often present, including the physician leader (98%), primary nurse (95%), respiratory therapist (83%), secondary nurse

(83%), charge nurse (81%), and resident (70%); other members included pharmacists, social workers, translators, and patient advocates. Participation by all team members should be encouraged, but exceptions could be allowed for members who are emotionally unable to attend. Inviting others who were not engaged in the event enables more people to learn from the experience.[8] This benefit may be outweighed by potential harms of a longer duration of debriefing or a more limited discussion of sensitive topics because of a decreased sense of psychological safety.[27] Although parents and patients could theoretically participate in the debriefing, their presence may also have a significant effect on the scope and content of

Table 3. Potential triggers for debriefing in the clinical setting.

Category	Examples
Presenting complaint	Respiratory distress
	Cardiac arrest
	Hypotension
	Unresponsiveness
Final diagnosis	Sudden infant death syndrome
	Cardiac tamponade
	Septic shock
	Stroke
Acuity level	Highest severity triage level (eg, level 1)
	Crash cart used
	Extremely abnormal vital signs (eg, any pulse rate >220 beats/min)
Disposition	Death
	Intensive care
	All transfers out of institution
Location of care	Trauma bay
	Medical resuscitation room
Complications, errors	Near-miss event
	Patient harm
Interpersonal	Upset/violent patients involving calls to security
	Arguments between clinical providers

communication from the group. Medicolegal implications of debriefing with family members are also uncertain.

Debriefing Facilitator

Who should facilitate the debriefing? Although team authority figures (eg, physician team leader, charge nurse) most commonly lead debriefings,[5,12,28,29] their role as facilitator has the potential to inhibit or bias the discussion. Adding a co-debriefer may help mitigate this effect. Alternative facilitators could include other team members who were not leading the resuscitation. The nurse documenter is often a good choice to facilitate or cofacilitate because they can share knowledge of when medications were administered or other critical actions were performed. Having somebody from outside the ED serve as a facilitator is also an option, but this is generally limited because of logistic challenges.

Training of Facilitators

In a recent ED survey, a lack of trained or qualified debriefing facilitators was cited as the second most common barrier to debriefing.[12] Ideally, specific training in postevent debriefing would also incorporate education in human factors, patient safety, and quality improvement methodologies. Although integrated courses such as this do not exist, specific training in debriefing methodology for health care workers is available (although primarily focused on simulation-based debriefing).[1,30,31] Most important is to cultivate the skill of debriefing through experiential learning. Using an evidence-based script is one way to standardize debriefing sessions while offering novice debriefers "on the job" experience.[5,26] Social workers and psychologists may also be considered candidates for further training because they already possess formal training in facilitating discussions.[3] Typically, a facilitator more familiar with clinical medicine (eg, physician, nurse) is the preferred choice.[5,12,28,29] Another potential solution to the lack of trained facilitators is to teleconference in a remote facilitator. Although some simulation programs are embracing this method, challenges for postevent debriefing include patient privacy concerns, technology reliability, and lack of intimacy.[32]

HOW?

Debriefing should include a friendly atmosphere, open-ended questions, honest dialogue, and identification of behaviors or perceptions that lead to improved outcomes.[1] Postevent debriefing literature is scant compared with the simulation literature. Although similar theories may apply to both, there are unique aspects to debriefing in each setting that are still being worked out.[5,7,8,11,16,21,30,33,34] Careful selection of the appropriate debriefing method(s)

should be considered when implementing a clinical debriefing program in the ED. Like any skill, various debriefing methods will vary with regard to how much skill and practice is needed to attain mastery (personal communication, Adam Cheng, November 2014).

Debriefing Methods

The most commonly cited method for debriefing in the clinical environment is usually referred to as "plus-delta" and involves group-based reflection and assessment of what went well, what did not go well, and what participants need to change to improve care. The focus here is not simply on patient outcomes (eg, patient survived or died) but on the structures (eg, "The video laryngoscopy was broken") and processes (eg, "We established intravenous line access fast") that contributed to the outcomes.[35] The essence of this approach is to engage participants in an active assessment of performance and then use their observations as starting points for discussions on how to improve performance.[1,5,36] Although this approach is easy to learn and implement, some pitfalls for the inexperienced debriefer to avoid may include tangential discussion (eg, generating lists of mistakes without dissecting the underlying rationale), turning the debriefing into a blame session, and leaving members out of discussion. Following a structured format can help debriefing participants and facilitators to avoid these pitfalls.[5]

Reflective learning is a strategy (used as part of the "advocacy-inquiry" and "cognitive autopsy" methods) that should be incorporated into debriefing to engage participants in a deeper discussion to uncover underlying rationales for decisions, behaviors, or actions.[21,30,33,34,37] Once the rationale is uncovered, it is used for discussion, learning, and the formation of concrete "take-home" messages. These methods are highly effective in promoting rich discussion but may be challenging to learn and difficult to master (personal communication, Adam Cheng, November 2014). Blending various debriefing strategies can customize the right method for a given event. For example, a facilitator may home in on an error discussed during a plus-delta exercise ("We didn't give the correct dose of epinephrine"), switch to reflective inquiry to discover why the incorrect thought process occurred ("We can all agree this was an issue, but why do you think that occurred"), and learn from the nurse that the dosing was based on pounds and not kilograms. Note that emphasis is not on the error but on discovering why it happened and preventing it for future cases.

Directive feedback is commonly used after simulation-based procedural skills training as a unidirectional approach (facilitator to participant) to address specific gaps in individual performance.[38] Facilitators, however, can run

the risk of not addressing the appropriate learning gap if they have not taken the time to uncover the underlying rationale behind specific behaviors. Directive feedback can often be perceived as harsh criticism, especially in a team-based debriefing format. A meta-analysis of debriefing styles revealed that team-based debriefing had the greatest effect when the debriefing focused on the team's performance rather than the individual.[6]

Debriefing Phases

Debriefing in any high-risk industry includes 3 general phases: description, analysis, and application to future events.[39] Although there is no single criterion standard for what phases should be part of a clinical debriefing, most sessions will generally include an overview of the purpose of the debriefing, the format and ground rules needed to establish a psychologically safe environment, discussion of content relevant to the objectives, review of actual actions, discussion of what went well and what did not, discussion of how to improve in the future, and a summary of take-home points.[31,33]

Debriefing Tools and Scripts

Standardization is challenging for any clinical debriefing program. One potential solution is the use of debriefing tools or scripts to help guide facilitators and teams through a specific method of debriefing.[12,20,21,24] Cheng et al[20] used a debriefing script for novice pediatric advanced life support facilitators in a simulation-based study to promote standardized discussion of key learning objectives, using the advocacy-inquiry method of debriefing, tailored to promote reflective learning.[23] Mullan et al[5] described the implementation of the Debriefing In Situ Conversation in Emergency Room Now debriefing tool in the ED setting, which guides facilitators through a scripted plus-delta method of debriefing (Figure). Implementation of debriefing tools in the clinical environment should be paired with appropriate orientation for providers to ensure they are used appropriately.

Use of Adjuncts During Debriefing

Inherent risks of relying on participant memory include recall errors and potentially missing actionable items that
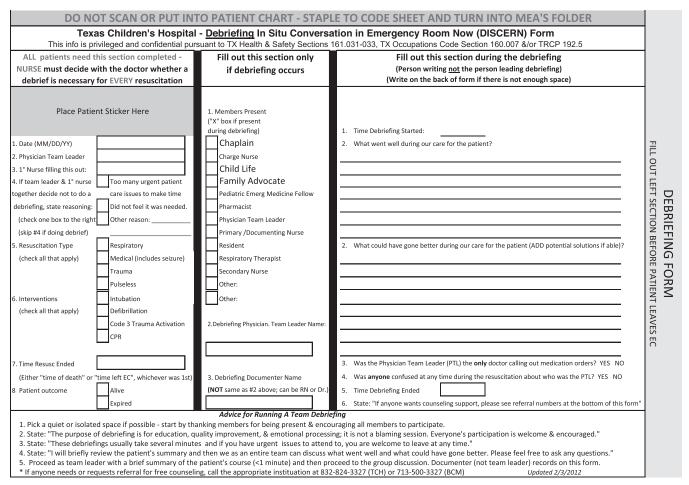

Figure. Sample debriefing instrument: DISCERN.

might be identified from more accurate data-capturing methods.[5] Therefore, the use of adjuncts during debriefing, such as video playback and quantitative performance data, has promise in improving outcomes in simulated and clinical contexts.[25,33,40-42] Clinicians in ED, neonatology, and trauma care have implemented real-time video capture of resuscitation events in the clinical environment as part of local quality programs.[43-51] Nadler et al[25] demonstrated that including video recordings of neonatal resuscitations in debriefings improved teamwork in future neonatal resuscitations. The simulation literature is more mixed, with a meta-analysis demonstrating that video-assisted debriefing has negligible and nonsignificant effects on time-related skills.[10,11,33,40-42] Last, debriefing with the addition of quantitative data in the form of transcripts of the clinical event or chest compression data adds an objective nature to the discussion.[7,8] The benefits of adding technology adjuncts should be weighed against the expenses, time, and resources necessary to establish and maintain a program.[27]

WHEN?

Finding the time to debrief is often challenging. The timing of debriefing has been classified with temperature adjectives, termed "hot" (immediately after the event), "warm" (minutes to hours after an event), and "cold" (days to weeks after an event) debriefings.[52] When feasible, some form of debriefing should be conducted as soon as possible after an event.[23] Advantages of hot and warm debriefings are that the entire team is usually available, a greater variety of clinical staff is typically involved, recall bias is minimized, and urgent issues can immediately be addressed. Potential disadvantages include limited time during a shift, limited space to debrief, and the emotional readiness of members to debrief. Cold debriefing can take advantage of the availability of quantitative data and follow-up patient information, as well as the ability to include nonparticipants in the debriefing. Disadvantages include the challenge of reassembling the entire team, the administrative resources needed to organize these sessions, and potential alterations in the quality of the discussion because of the larger group format.[27] Prescriptive durations for debriefing do not exist, but generally hot and warm debriefings last approximately 10 minutes, whereas cold debriefings typically take an hour or longer.[6,27]

The goals of hot and cold debriefing are both to improve care delivery, but the processes and structure of each method will affect the capabilities to improve the system with each type of debriefing. Factors to help decide whether further cold debriefing should take the form of morbidity and mortality rounds, root-cause analysis, or other quality assurance processes may be derived from local protocols or based on whether the debriefing team believed that the hot or warm debriefing did not provide enough time, quantitative data, or administrative representatives to address all of the pertinent issues encountered. A hybrid approach may be taken routinely for certain select events (eg, high-risk injuries or preventable deaths), with both a hot and cold debriefing occurring for the same event.

WHERE?

With most ED space already designated for 1 or more functions, finding an ideal location to debrief events can be challenging.[27,53,54] The value of debriefing in the space where an event occurred will depend on the objectives of the debriefing. Debriefing in the actual space helps teams to evaluate factors that may otherwise be missed by debriefing in a separate space, including the setting, resources, and processes of an event.[55] Also, a team can practice technical skills with the same equipment from an event (eg, rapid infuser setup). Debriefing in the same location as the clinical event should be balanced with the need to prepare or use that location for the next patient. Alternatively, a separate location may allow tension to be defused, enhance privacy, limit distractions, and enhance participant comfort.[1] Some departments might consider an assigned room proximal to patient care that can be used for debriefing after clinical events. If technological adjuncts will be used as part of the debriefing, the debriefing location may be limited to a specific location with such capabilities. The question of where will also depend on when the debriefing occurs. Cold debriefings traditionally happen in a conference room separate from the clinical environment, whereas warm debriefings happen in either the location of the event or one nearby.[5,8]

OTHER CONSIDERATIONS
Postdebriefing

Documentation of key findings and discussion points raised in a debriefing can help with follow-up and promote accountability in a clinical debriefing program.[26] Whatever recording method is used (eg, paper, video), it should coordinate with existing quality improvement processes. The recording methods should also be reviewed with the hospital's medicolegal team to ensure that proper safeguards are in place to protect teams from medicolegal liabilities. Without such protections, teams might feel hesitant to share information about suboptimal care that could drive improvements in future care delivery.[5] Furthermore, collaborating and coordinating with preexisting quality and patient safety processes can be integral to the long-term success of any program focused on patient improvement.

Designating a follow-up person for system issues that are identified during debriefings can be critical to building the trust in your ED that the concerns raised in debriefings are being adequately addressed. Ideally, this person will either have a role or work in concert with quality, patient safety, or risk management so that missions and goals are clearly aligned with existing hospital or other academic obligations. This person should prioritize issues identified from debriefings because some safety issues are more time sensitive (eg, missing vital equipment) than others. Realistically, several ED management staff will likely be necessary to address various issues from debriefings (eg, pharmacist for medications, respiratory therapist for equipment problems, medical director for clinical issues). Learning points and actions taken in response to clinical debriefings should be communicated in a structured manner to ensure that all relevant health care providers have the opportunity to learn from the clinical event and debriefing. Closing the loop with ED staff is an important feature to reinforce a culture of safety and let people know that their feedback leads to actual change and improvement. Some examples include hanging posters displaying improvement in metrics or sending a monthly e-mail summarizing specific changes resulting from debriefings.

Another important consideration is caring for the ED staff involved in the event. ED providers may experience psychological distress after a clinical event as a "second victim" or as a result of debriefing the event.[56,57] Most hospitals have resources available for employees who experience distress at work. Debriefing facilitators should routinely make participants aware of the available resources for employees and be prepared to direct them to further professional help when necessary.[5]

Promoting Uptake of Debriefing Practices

Identifying and cultivating a champion is essential to beginning, sustaining, and growing an ED clinical debriefing program.[5] The champion(s) should be charged with receiving advanced education in debriefing techniques, educating fellow ED providers in the art of debriefing, encouraging peers to comply with debriefing when predetermined event triggers arise, and providing tools (eg, standardized debriefing forms) for providers to use in practice.

For a debriefing program to succeed, a culture of safety for patients and staff must be reinforced.[26] Debriefing participants need assurance from leadership that their job is not in jeopardy for reporting suboptimal care occurrences in a debriefing. Participants also need to know that debriefings are not hostile blaming sessions. Although the general lessons learned from debriefings will be shared widely across the ED,

any sensitive discussion points in a debriefing should remain confidential to the debriefing group.

To promote hospital-wide support, debriefings should become standard practice for specific clinical events that are predetermined by each unit in the hospital. Hospital and division leadership must value debriefing, protect the time of its employees to perform this activity, and allocate time for debriefing champions to run the program. Standardizing the format, language, and processes of debriefing across a hospital will promote sustainability and make it easier to monitor and report on debriefing outcomes within a system. We encourage new and existing programs to use Table 1 as a guide to integrating debriefing into the clinical environment.

Case Study Redux

After 15 minutes to attend to other urgent patient needs, you call a debriefing back in the code bay for the resuscitation team that just cared for the patient. Using a standardized debriefing form, you and the patient's nurse co-debrief the team. The form includes a scripted statement of the purpose of the debriefing, guidelines for discussion, and an outline for framing the discussion. The team identifies areas of strength and describes specific actions that could be taken to improve future care. The form is passed on to the local debriefing champion, who works with leadership and responds to the team with feedback based on their input.

CONCLUSIONS

Although the clinical environment is more chaotic than a classroom setting, there are unique learning opportunities in the clinical setting. Structured debriefing can help teams to improve future clinical care and is an important tool for emergency physicians to have in their management toolbox to help them run a successful ED. This article serves as a practical guide to help practitioners start debriefing after clinical events and help stakeholders to initiate debriefing programs in their ED.

Author affiliations: From the Columbia University Medical Center, New York Presbyterian Morgan Stanley Children's Hospital of New York, New York, NY (Kessler); the Children's National Medical Center, George Washington University School of Medicine and Health Sciences, Washington, DC (Mullan); and the KidSIM Simulation Program, Alberta Children's Hospital, University of Calgary, Calgary, Alberta, Canada (Cheng).

REFERENCES

1. Fanning RM, Gaba DM. The role of debriefing in simulation-based learning. *Simul Healthc.* 2007;2:115-125.
2. Marshall SLA. *Island Victory—The Battle of Kwajalein Atoll.* New York, NY: Penguin Books; 1944.
3. McDonnell LK, Jobe KK, Dismukes RK. *Facilitating LOS Debriefings: A Training Manual. Moffett Field: Part 1: An Introduction to Facilitation.* Mountainview, CA: Ames Research Center: National Aeronautics and Space Administration; 1997.
4. Bacon A. Death on the table—some thoughts on how to handle and anaesthetic-related death. *Anaesthesia.* 1989;44:245-248.
5. Mullan PC, Wuestner E, Kerr TD, et al. Implementation of an in situ qualitative debriefing tool for resuscitations. *Resuscitation.* 2013;84:946-951.
6. Tannenbaum SI, Cerasoli CP. Do team and individual debriefs enhance performance? a meta-analysis. *Hum Factors.* 2013;55:231-245.
7. Edelson DP, Litzinger B, Arora V, et al. Improving in-hospital cardiac arrest process and outcomes with performance debriefing. *Arch Intern Med.* 2008;168:1063-1069.
8. Wolfe H, Zebuhr C, Topjian AA, et al. Interdisciplinary ICU cardiac arrest debriefing improves survival outcomes. *Crit Care Med.* 2014;42:1688-1695.
9. Jiang C, Zhao Y, Chen Z, et al. Improving cardiopulmonary resuscitation in the emergency department by real-time video recording and regular feedback learning. *Resuscitation.* 2010;81:1664-1669.
10. Cheng A, Eppich W, Grant V, et al. Debriefing for technology-enhanced simulation: a systematic review and meta-analysis. *Med Educ.* 2014;48:657-666.
11. Bhanji F, Mancini ME, Sinz E, et al. Part 16: education, implementation, and teams: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation.* 2010;122:S920-S933.
12. Sandhu N, Eppich W, Mikrogianakis A, et al. Postresuscitation debriefing in the pediatric emergency department: a national needs assessment. *CJEM.* 2013;15:1-10.
13. Staple L, O'Connell K, Mullan P, et al. National survey of pediatric emergency medicine fellows on debriefing after medical resuscitations. *Pediatr Emerg Care.* 2014 Sep 5. [Epub ahead of print].
14. Raemer D, Anderson M, Cheng A, et al. Research regarding debriefing as part of the learning process. *Simul Healthc.* 2011;6(suppl):S52-S57.
15. Lewin K, Heider F, Heider G. *Principles of Topological Psychology.* New York, NY: McGraw-Hill; 1936.
16. Zigmont JJ, Kappus LJ, Sudikoff SN. The 3D model of debriefing: defusing, discovering, and deepening. *Semin Perinatol.* 2011;35:52-58.
17. Patterson MD, Geis GL, Falcone RA, et al. In situ simulation: detection of safety threats and teamwork training in a high risk emergency department. *BMJ Qual Saf.* 2013;22:468-477.
18. Geis GL, Pio B, Pendergrass TL, et al. Simulation to assess the safety of new healthcare teams and new facilities. *Simul Healthc.* 2011;6:125-133.
19. Cook DA, Hatala R, Brydges R, et al. Technology-enhanced simulation for health professions education: a systematic review and meta-analysis. *JAMA.* 2011;306:978-988.
20. Cheng A, Hunt EA, Donoghue A, et al. Examining pediatric resuscitation education using simulation and scripted debriefing: a multicenter randomized trial. *JAMA Pediatr.* 2013;167:528-536.
21. Cheng A, Rodgers DL, van der Jagt E, et al. Evolution of the pediatric advanced life support course: enhanced learning with a new debriefing tool and web-based module for pediatric advanced life support instructors. *Pediatr Crit Care Med.* 2012;13:589-595.
22. Cheng A, Goldman RD, Aish MA, et al. A simulation-based acute care curriculum for pediatric emergency medicine fellowship training programs. *Pediatr Emerg Care.* 2010;26:475-480.
23. Arafeh JM, Hansen SS, Nichols A. Debriefing in simulated-based learning: facilitating a reflective discussion. *J Perinat Neonatal Nurs.* 2010;24:302-309; quiz 310-311.
24. Clay AS, Que L, Petrusa ER, et al. Debriefing in the intensive care unit: a feedback tool to facilitate bedside teaching. *Crit Care Med.* 2007;35:738-754.
25. Nadler I, Sanderson PM, Van Dyken CR, et al. Presenting video recordings of newborn resuscitations in debriefings for teamwork training. *BMJ Qual Saf.* 2011;20:163-169.
26. Salas E, Klein C, King H, et al. Debriefing medical teams: 12 evidence-based best practices and tips. *Jt Comm J Qual Patient Saf.* 2008;34:518-527.
27. Zebuhr C, Sutton RM, Morrison W, et al. Evaluation of quantitative debriefing after pediatric cardiac arrest. *Resuscitation.* 2012.
28. Ireland S, Gilchrist J, Maconochie I. Debriefing after failed paediatric resuscitation: a survey of current UK practice. *Emerg Med J.* 2008;25:328-330.
29. Theophilos T, Magyar J, Babl FE, et al. Debriefing critical incidents in the paediatric emergency department: current practice and perceived needs in Australia and New Zealand. *Emerg Med Australas.* 2009;21:479-483.
30. Rudolph JW, Simon R, Rivard P, et al. Debriefing with good judgment: combining rigorous feedback with genuine inquiry. *Anesthesiol Clin.* 2007;25:361-376.
31. Rudolph JW, Simon R, Raemer DB, et al. Debriefing as formative assessment: closing performance gaps in medical education. *Acad Emerg Med.* 2008;15:1010-1016.
32. Ahmed R, King Gardner A, Atkinson SS, et al. Teledebriefing: connecting learners to faculty members. *Clin Teach.* 2014;11:270-273.
33. Sawyer TL, Deering S. Adaptation of the US Army's after-action review for simulation debriefing in healthcare. *Simul Healthc.* 2013;8:388-397.
34. Rudolph JW, Simon R, Dufresne RL, et al. There's no such thing as "nonjudgmental" debriefing: a theory and method for debriefing with good judgment. *Simul Healthc.* 2006;1:49-55.
35. Donabedian A. The quality of care: how can it be assessed? *JAMA.* 1988;260:1743-1748.
36. Ahmed M, Arora S, Russ S, et al. Operation debrief: a SHARP improvement in performance feedback in the operating room. *Ann Surg.* 2013;258:958-963.
37. Croskerry P. Diagnostic failure: a cognitive and affective approach. In: Henriksen K, Battles J, Marks E, eds. *Advances in Patient Safety: From Research to Implementation (Volume 2: Concepts and Methodology).* Rockville, MD: Agency for Healthcare Research & Quality; 2005:241-254.
38. Hatala R, Cook DA, Zendejas B, et al. Feedback for simulation-based procedural skills training: a meta-analysis and critical narrative synthesis. *Adv Health Sci Educ Theory Pract.* 2014;19:251-272.
39. Mackinnon R, Gough S. What can we learn about debriefing from other high-risk/high-stakes industries? *Cureus.* 2014;6:e174.
40. Grant J, Moss J, Epps C, et al. Using video-facilitated feedback to improve student performance following high-fidelity simulation. *Clin Sim Nurs.* 2010;6:e177-e184.
41. Byrne AJ, Sellen AJ, Jones JG, et al. Effect of videotape feedback on anaesthetists' performance while managing simulated anaesthetic crises: a multicentre study. *Anaesthesia.* 2002;57:176-179.

42. Sawyer T, Sierocka-Castaneda A, Chan D, et al. The effectiveness of video-assisted debriefing versus oral debriefing alone at improving neonatal resuscitation performance: a randomized trial. *Simul Healthc.* 2012;7:213-221.

43. Carbine DN, Finer NN, Knodel E, et al. Video recording as a means of evaluating neonatal resuscitation performance. *Pediatrics.* 2000;106: 654-658.

44. Finer NN, Rich W. Neonatal resuscitation: toward improved performance. *Resuscitation.* 2002;53:47-51.

45. O'Donnell CP, Kamlin CO, Davis PG, et al. Ethical and legal aspects of video recording neonatal resuscitation. *Arch Dis Child Fetal Neonatal Ed.* 2008;93:F82-F84.

46. Gelbart B, Barfield C, Watkins A. Ethical and legal considerations in video recording neonatal resuscitations. *J Med Ethics.* 2009;35:120-124.

47. Finer N, Rich W. Neonatal resuscitation for the preterm infant: evidence versus practice. *J Perinatol.* 2010;30(suppl):S57-S66.

48. Gelbart B, Hiscock R, Barfield C. Assessment of neonatal resuscitation performance using video recording in a perinatal centre. *J Paediatr Child Health.* 2010;46:378-383.

49. Ellis DG, Lerner EB, Jehle DV, et al. A multi-state survey of videotaping practices for major trauma resuscitations. *J Emerg Med.* 1999;17:597-604.

50. Brown DM. Video recording of emergency department trauma resuscitations. *J Trauma Nurs.* 2003;10:79-80.

51. Oakley E, Stocker S, Staubli G, et al. Using video recording to identify management errors in pediatric trauma resuscitation. *Pediatrics.* 2006;117:658-664.

52. Cooper S, Cant R, Porter J, et al. Rating medical emergency teamwork performance: development of the Team Emergency Assessment Measure (TEAM). *Resuscitation.* 2010;81:446-452.

53. Pines JM, Hilton JA, Weber EJ, et al. International perspectives on emergency department crowding. *Acad Emerg Med.* 2011;18:1358-1370.

54. Institute of Medicine Committee on the Future of Emergency Care in the United States Health System. *Hospital-Based Emergency Care: At the Breaking Point.* Washington, DC: National Academies Press; 2006.

55. Small SD. Simulation applications for human factors and systems evaluation. *Anesthesiol Clin.* 2007;25:237-259.

56. Seys D, Wu AW, Van Gerven E, et al. Health care professionals as second victims after adverse events: a systematic review. *Eval Health Prof.* 2013;36:135-162.

57. McCay L, Wu AW. Medical error: the second victim. *Br J Hosp Med (Lond).* 2012;73:C146-C148.