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Briefing and debriefing during simulation-based training and beyond: Content, structure, attitude and setting



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In this article, we review the debriefing literature and point to the dilemma that although debriefings especially intend to enhance team (rather than individual) learning, it is particularly this team setting that poses risks for debriefing effectiveness (e.g., preference-consistent information sharing, lack of psychological safety inhibiting structured information sharing, ineffective debriefing models). These risks can be managed with a mindful approach with respect to content (e.g., specific learning objectives), structure (e.g., reactions phase, analysis phase, summary phase), attitude (e.g., honesty, curiosity, holding the trainee in positive regard) and setting (e.g., briefings to provide orientation and establish psychological safety). We point to the potential of integrating systemic methods such as circular questions into debriefings, discuss the empirical evidence for debriefing effectiveness and highlight the importance of faculty development.

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Debriefing is a core element of team learning and simulation-based training [1–5]. It is an instructor-guided conversation among trainees that aims to explore and understand the relationships among events, actions, thought and feeling processes, as well as performance outcomes of the simulation [1,3,6,7]. Those of us who have debriefed a team or have been debriefed after a simulation or an event have most likely gotten a feel for how challenging this conversation can be.

If a debriefing is such a challenging conversation, why could we as instructors not simply give feedback to the learners and hope they perform better next time? The answer is manifold: unidirectional feedback does neither help understanding the learners' point of view, nor identifying the actual performance gap nor exploring the meaning of patterns among team members. Behaviour change is more likely to occur sustainably via double-loop (i.e., correcting errors by altering the underlying values and then the actions) than single-loop learning (i.e., correcting errors without changing underlying values) [1,8,9]. Adult learners benefit from experiential learning in which concrete experiences (e.g., participating in a simulated case) are the basis for observations and reflections that are consolidated into abstract concepts (e.g., during debriefings) that can be actively tested in a subsequent experience (e.g., participating in another simulated case) [10]. Ideally, debriefings allow for developing strategies that can be applied in future performance episodes [2,11–13]. This makes them a core element of team learning and simulation-based training.

In this article, we review the debriefing literature and describe debriefing pitfalls as well as ingredients for debriefing success with respect to content, structure, attitude and setting. These pitfalls and success criteria are not limited to the context of simulation-based training but can be applied to clinical debriefing contexts as well. In both contexts, debriefings are particularly used to facilitate team rather than individual learning [14,15]. Though essential, it is particularly this team-setting that poses risks for debriefing effectiveness [16]. We therefore start by highlighting this debriefing dilemma of having to reflect on teamwork (e.g., updating team mental models in a dynamic situation) within the team setting while dealing with common team phenomena (e.g., preference for talking about task work rather than teamwork).

Talking about teamwork

Why teams need to reflect on teamwork

The empirical evidence demonstrating that poor teamwork represents one of the major factors contributing to medical error and can result in the loss of life has been growing [17,18]. Still, medical and nursing schools do not yet sufficiently teach teamwork skills, resulting in clinicians' underestimation of the contribution of teamwork to high-quality patient care [17]. The importance of good teamwork and the unawareness of this importance are all the more reason to help health care teams embrace teamwork and learn how to improve it.

Why teams need debriefings to reflect on teamwork

High team performance requires regular reflections on teamwork; teams that reflect outperform teams that do not reflect [19,20]. Unfortunately, teamwork is not yet a given, regular subject in clinical education. Students do not sufficiently learn how to work in inter-professional teams, let alone how to reflect on it. In addition, teams are generally reluctant to systematically talk about teamwork [21], explaining why discussions about teamwork rarely just happen [16,22–24]. Without debriefings that are explicitly initiated, embedded in simulation-based training or even in the clinical context, well-structured and supported by leadership, learning to improve teamwork will remain sparse.

Why debriefings need debriefing expertise

The limited use of debriefings in clinical practice may also be due to barriers that make team debriefing a daunting task (Table 1). As Eddy and colleagues put it, 'if left on their own, teams often fail to debrief, and, even if they do, their natural information processing tendencies can inhibit the quality of the debrief' (p. 4) [16]. Ill-structured debriefings risk failure due to individual and social phenomena

Table 1
Barriers for conducting effective team debriefings.

Level	Barriers
Individual	Cognitive biases, heuristics and errors such as the fundamental attribution error [28] Lack of trained debriefing competence [29,30] Lack of knowledge about human factors and teamwork patterns Unilateral focus on either human or physical/environmental factors [31] Talking primarily about actions instead of meanings, thoughts and feelings and interactions [26] Premature feeling of certainty rather than being truly open for new perspectives which puts debriefers at risk to provide unidirectional feedback: they would tell their colleagues what they did wrong rather inquire their point of view and elicit mental models which would allow for detecting and correcting performance gaps in a sustainable way and permit double-loop learning from experience [1,8,22,28,32,33] Stuck in dilemma of judgemental vs. non-judgemental debriefing [26,34]
Team	Reluctance against explicit communication among trainees [21] More comfort with talking about technical aspects than with talking about teamwork [22] Tendency to rather talk about issues that are already known to all team members instead of sharing new and unique perspectives [35,36]; especially during constrained time periods as is the case with debriefings [37] Risk to share only information that is consistent with existing views [38] Waiting until late in the debriefing before bringing up new information [16] Not feeling psychologically safe to speak up [39]; especially young or subordinated team members would be less likely to speak up with ideas and concerns [40,41], and their ideas would probably not influence the debriefing outcome [35,42] 'Undiscussable' topics [27]
Organization	No organizational support and no clarification of roles No embeddedness in organizational learning structure (e.g., no follow-up on issues raised in debriefings) No 'safe container' for learning during simulation-based training [42] 'Undiscussable' topics [27]

such as preference-consistent information sharing, lack of psychological safety inhibiting structured information sharing and ineffective debriefing models [16,22,25,26]. Without establishing debriefing routines, the undiscussable will hardly become discussable [27].

Talking about the 'right' things in the 'right' way

Ingredients for debriefing success

To overcome the barriers for debriefing effectiveness, instructors can use a mindful interplay of content, structure, attitude and setting factors.

The *content* of the debriefing is to a large extent predefined by the learning objectives of the simulated case or the clinical encounter [43,44]. They provide the basis for defining the desired behaviour. After having observed a gap between (or match of) desired and actual performance, the instructor provides feedback on this gap (or match) and, with the team, investigates the basis for the gap (or match) by exploring the trainees' underlying frames as invisible drivers of their actions [1,8,43]. Once frames are identified, the instructor helps the trainees to explore and reinforce frames that contributed to high performance and/or to close performance gaps by reframing and didactics [43]. Given that teams tend to talk about task work rather than teamwork, it seems useful to introduce those learning objectives involving teamwork, communication and crisis resource management early in the debriefing and to help the team surfacing dynamic interaction patterns [15,22,45]. Ideally, trainees leave a debriefing with a deeper understanding of how teamwork and human factors contributed to clinical outcomes [6,15,46].

Although the debriefing *structure* suggested in the literature varies to some extents, it usually follows three main phases: reactions, analysis and summary [23,43]. In the reactions phase, trainees can express their emotional reactions to the simulated case which also serve as critical information for the instructor and can help refine the learning objectives [15,43,47]. For example, if a trainee said that she found the simulation very chaotic, the instructor can help explore – during the later analysis phase – what might have contributed to the chaos and which interactions among team members may

facilitate order. The instructor also previews the purpose and form of the debriefing as well as provides facts about the simulated case and clarifies clinical questions, and may address issues of realism [15,42,43,48,49]. In the analysis phase, the instructor addresses each of the learning objectives, helps identifying performance gaps and provokes in-depth discussion allowing the trainees to reflect on their thinking behind their actions within the team and to close performance gaps [43,47,48]. In the summary phase, the instructor asks the trainees to distil their reflections into take-aways with respect to future performance [43,49]. If required and possible, deliberate practice of specific actions may follow the debriefing [15,50]. Recent research has also pointed to the crucial role of the pre-simulation briefing – as a precursory phase – for setting the stage for an engaging learning environment at all [42].

With respect to *attitude* we will highlight three mindsets which we consider vital for debriefing effectiveness: honesty, curiosity and holding the trainee in positive regard [1]. Over the last 15 years, debriefing concepts have moved away from the non-judgemental approach, which suggested that instructors should withhold their point of view and that trainees should find out on their own what they did wrong and how to improve it. For example, the training manual for facilitating line-oriented simulation (LOS) debriefings in aviation suggested that 'rather than telling the crew what they did wrong during the LOS and how they can improve, try to get the crew to figure it out for themselves. If they discover what they need to work on by themselves, then they are much more likely to learn from their own mistakes and carry that learning over to the line [...] If you give your analysis before the crew does, the crew will feel less responsible for making their own analysis' (p. 4) [51].

By contrast, the more recent Debriefing with Good Judgment approach draws on research on behavioural and cognitive science and emphasizes the disclosure of the instructors' point of view [26]. This approach proposes that 'in spite of a desire to appear nonjudgmental, hints of one's views often "leak" via subtle cues such as facial expression, [...], and body language' and that withholding judgment 'conveys that mistakes are not discussable, or possibly shameful, undermining the very values – mistakes are puzzles to be learned from rather than crimes to be covered up – instructors aim to endorse with the nonjudgmental approach' (p. 52) [26].

Thus, to stop treating mistakes as an undiscussable topic, instructors must reveal their point of view [27]. The instructors' honesty about their frames combined with genuine curiosity about the learners' frames and holding the learner in positive regard is what Rudolph and colleagues have described 'an underlying debriefing "stance"' that facilitates double-loop learning [25,26].

Consequently, recent debriefing concepts are outlining how to create a *setting* in which trainees feel simultaneously challenged and psychologically safe to engage in rigorous reflection [42]. Particular times for creating such a setting are the pre-simulation briefing and the beginning of the debriefing in which the instructors provide transparency about objectives, expectations, rules of conduct and logistics [42,48,49]. The instructors can reinforce this setting by holding the underlying debriefing stance (i.e., honesty, curiosity, positive regard of trainee) and by talking via combining advocacy with inquiry [1,25,26,43]. An ideal setting does not leave the trainees guessing about expectations or the instructor's point of view but provides orientation, engagement and curiosity. More literature findings on characteristics of effective debriefings are listed in Table 2.

Briefing and debriefing tools

In line with the growing realization of the importance of reflections during and beyond simulation-based trainings, more and more briefing and debriefing tools are developed:

For *briefings*, Rudolph and colleagues have suggested a way for establishing a 'safe container' allowing trainees to engage actively in simulation and debriefing. It includes clarifying expectations, establishing a fiction contract with trainees (i.e., collaborative and explicit agreement among instructors and trainees "to commit to playing fair with respect to fidelity and realism), explaining logistic details and declaring and enacting commitment to respecting trainees and concern for their psychological safety [42,67].

For *debriefings*, the Debriefing with Good Judgment [1] is the fundamental approach stimulating the development of discipline-specific (e.g., the EXPRESS - Examining Pediatric Resuscitation Education

Table 2
Literature findings on characteristics of effective debriefings.

	Characteristic	Sample references	
How?	Explicitly initiated	[14,16,22]	
	Active (vs. passive)	[1,10,22,47,48,51,52]	
	Structured, following a specific order of questions (vs. unstructured), e.g., 1. Reactions, 2. Analysis, 3. Summarize	[1,15,16,22,49]	
	Developmental (vs. administrative) intend	[1,22,47,52]	
	Instructors/leaders should engage in leader inclusiveness (i.e., by explicitly inviting and appreciating team members' input) to establish psychological safety in the team	[1,6,39,41,47,48,53,54]	
	With 'good judgement' (i.e., honest, curious, holding learner in positive regard, combining advocacy with inquiry) instead of judgemental or non-judgemental	[1,15,22,25,26,32,43,47,48,52,55]	
	Specific (vs. general)	[1,22,47,48,52]	
	Include multiple (vs. single) information sources; video-assistance is helpful but not necessary	[9,22,56]	
	Double-loop instead of single-loop learning, i.e., inquiry instead of only telling	[1,8,32]	
	Exploring team behaviour patterns via systemic-constructivist methods	[15,57]	
	Adaptive to team's responsiveness	[51]	
	During simulation-based training: embedded in a psychologically safe training context with steps taken to allow for a fiction contract (both established in introduction/briefing and maintained during each debriefing)	[7,42,58,59]	
	When (in clinical practice)?	Regularly, consistently	[14,22]
		After any team experience	[22]
		Depending on learning objective either terminal or concurrent	[9]
After real patient cases or work shifts		[22]	
Close in time to the performance of interest to avoid loss of information		[22]	
During team transition phases		[20,60–62]	
How long?	Usually 30 min, but can be as short as 5 min	[22,52]	
	During simulation-based training: 30–60 min	[15,52]	
By whom?	Trained instructors who regard learners as intelligent, competent, willing to do their best and wanting to improve and who are open for learners	[1,13,26,43]	
	Personal instructor (vs. multimedia with no instructor)	[9]	
	Trained team leaders and facilitators	[1,6,15,22,47,59,63,64]	
	Physicians and nurses trained in conducting debriefings	[14,24]	
What about?	Predefined learning objectives of the simulated case or the clinical encounter	[43,44]	
	Interplay of cognition, clinical and teamwork behaviours, and clinical and behavioural outcome, crisis resource management	[6,15,43,51]	
	Teamwork (as early as possible); interaction patterns among team members and their meaning	[6,15,22,45]	
	Role-behaviour	[14]	
	Frames that led to observed actions	[1,8,43]	
	Exploring both positive (i.e., reinforcing ideal actions) and negative (i.e., closing performance gaps) performance outcomes	[15,43,63,65]	
	The 'elephant in the room'	[27,66]	

using Simulation and Scripting - debriefing tool for paediatric advanced life support training) [44] and supplementary approaches (e.g., TeamGAINS which includes systemic-constructivist techniques) [15] for simulation-based trainings. For debriefings outside of simulation, SHARP (Set learning objectives, How did it go?, Address concerns, Review learning points, Plan ahead) has been developed for debriefings in surgery [24] and DebriefNow has been developed as a web-based tool particularly focusing on teamwork and shared cognition [16,22].

Applying systemic-constructivist methods to reflect on team interaction

Systemic-constructivist techniques have recently been introduced as a promising complement to established debriefing approaches [15,57]. They are based on family systems theory and constructivism as they are used in systemic therapy. Systemic therapy focuses on individuals within their systems, looking at patterns and dynamics of interactions rather than at isolated individual behaviour [68]. This makes them suitable for reflection on team interactions.

A particularly useful systemic technique is the *circular question*. Circular questions explore a dyadic relationship as it is seen by a third person by inviting the third person to describe the relationship of two others in their presence, for example, by asking a daughter how she sees the relationship between her sister and her mother [69]. They were initially developed as an interviewing tool but were soon considered an intervention tool in itself, triggering change [69–71]. By asking circular questions, an instructor can explore interactions, challenge linear perceptions of causality and introduce a circular perspective [70]. This not only helps the team learn about the recursiveness of behaviour patterns and view itself systemically, [72,73] but also helps revealing that views about problems and solutions may not be identical and that team members may have contrasting frames, thus enabling reflection on social phenomena such as the false consensus effect (i.e., tendency to overestimate the commonness of one's beliefs) [70,74]. As a side effect, the – often surprising – information gain might help the instructor maintain their curiosity [75]. Circular questions can complement common debriefing approaches. For example, if a nurse responded to the instructor's open-ended inquiry of the Debriefing with Good Judgment approach [1] (e.g., 'What was on your mind at that time?') with 'I thought that I would prepare the intubation while the registrar would start chest compressions', the instructor could explore this delayed start of the CPR with a circular question (e.g., 'Whose is usually the first to voice his or her concerns about delaying the start of CPR?'). More examples of circular questions are listed in Table 3.

Does it matter? Evidence for debriefing effectiveness

Research on debriefings is growing. A recent meta-analysis found that debriefings improved performance by 20–25% on average [76]. In surgery, for example, regular, role-based and guided debriefings were found to be associated with higher team performance [14]. However, empirical research investigating how differences in instructor communication are related to differences in debriefing outcome is just beginning to emerge. Although there is evidence demonstrating that facilitated debriefings are much more effective than non-facilitated debriefings, few studies have compared different debriefing facilitation methods or examined how differences in debriefer communication impact trainees' learning [16,24,55,76,77]. In addition, most studies examined debriefing effectiveness on the individual rather than team level and studied business students in experimental contexts rather than teams in the training or clinical setting, leaving open whether or how their findings are generalizable to non-experimental and team contexts [16,78–80]. Thus, in spite of the general evidence that debriefings work, more detailed, empirical research is necessary [4,76,81].

Table 3
Examples of circular questions.

Focus [69]	Sample question
Specific interactions patterns	'When a consultant joins the management of an unexpected difficult situation, what does the registrar usually do?'
Differences in behaviour rather than personality traits	'What does your consultant do when she seems not interested in hearing your point of view?'
Ranking and classification	'Who can speak up the most to the registrar when he seems stuck in an unsuccessful intubation?'
Change in the relationship before and after an event	'Do you feel that your colleagues shared their points of view more frequently before or after the consultant entered the OR?'
Hypothetical conditions	'If an intern had just observed you managing that case, what do you think he might have learned?'

Raemer and colleagues have suggested a guiding framework for debriefing research combining the '5 Ws' of debriefing research (Who?, What?, When?, Where?, Why?) with the PICO concept (population, intervention, comparator, outcome) [4].

Conclusion

As conducting debriefings is a challenging task – especially in light of the instructor's feedback dilemma of offering honest feedback without damaging the relationship with the trainees [25] – instructors benefit from deliberate practice as well as from training helping them to reflect on their debriefing practice [6]. Faculty development programmes can help instructors on basic, intermediate and advanced level to develop and enhance their debriefing competence. Especially for instructors on intermediate and advanced levels, regular, formative evaluation of their debriefings can provide feedback on strengths and fields of improvement. Validated tools for debriefing assessment are available, such as the Debriefing Assessment for Simulation in Healthcare (DASH) [7] and the Objective Structured Assessment of Debriefing (OSAD) [47]. In addition, as frequently done by psychotherapists, watching one's own videotaped debriefings can provide useful information for reflecting on one's debriefing practice [82].

Practice points

- Debriefing is different from unidirectional feedback. It aims for understanding the trainees' point of view, exploring interaction patterns among trainees, and identifying and closing actual performance gaps in a sustainable way.
- Debriefings rarely just happen because teams are generally reluctant to talk about teamwork. Teamwork is not yet a regular subject in clinical education and students do not yet learn how to reflect on it.
- Ill-structured debriefings risk failure due to pitfalls (e.g., preference-consistent information sharing, lack of psychological safety inhibiting structured information sharing and ineffective debriefing models).
- To overcome barriers for debriefing effectiveness, instructors can mindfully use an interplay of content, structure, attitude and setting factors.
- The content of the debriefing is predefined by the learning objectives of the simulated case or the clinical encounter, should focus on invisible drivers of actions rather than on actions only. Teamwork, communication and crisis resource management should be introduced early in the debriefing.
- The debriefing should follow a structure in which an initial reactions phase is followed by an in-depth analysis phase (including a preview of aim and content) and a concluding summary phase.
- Honesty, curiosity and holding the trainee in positive regard are necessary as well as helpful attitudes of instructors.
- Instructors need to create a setting in which trainees are not left guessing about expectations or the instructor's point of view but are provided with orientation, engagement and curiosity.
- Systemic-constructivist techniques such as circular questions are specifically suitable for reflecting on team interactions and can complement other debriefing approaches.
- Regular, formative evaluation of debriefings using validated assessment tools and targeted faculty development programmes can help instructors develop and enhance their debriefing competence.

Research agenda

- We need studies that compare different debriefing methods (also in different cultural contexts) and that use interaction analysis for examining how debriefer communication impacts trainees' learning.
- To design tools for team debriefing during clinical practice we need more empirical evidence on what allows for most effective learning during debriefings.
- Similar to scenario life savers', we need research developing and empirically testing debriefing life savers'.

Conflicts of interest statement

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