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Let's talk about it: Reframing communication in medical teams

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A B S T R A C T

Communication is associated with a significant percentage of errors or omissions in secondary healthcare across specialities; it is also the core process in and through which medical teams manage tasks, establish a rhythm and relationship between themselves and the patient, all of which are critical components of clinical practice. Despite this, however, communication is framed in medical training and the literature in either narrow terms or in a broad and fuzzy way, and it is indicative of the issue that teamwork and team communication are perceived and treated separately. In this paper, we draw on completed and ongoing interdisciplinary work to show how teams interact through illustrative examples from a large project on the management of obstetric emergencies. We provide a brief overview of the limitations in current tools and approaches, and we show how research under disciplines that have a long tradition in the analysis of interaction, and particularly healthcare sociolinguistics, can be translated and make a solid contribution to medical research and training.

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Team communication as teamwork and back

Failures or omissions attributed to communication are one of the top causes of errors in secondary healthcare leading to adverse patient outcomes which carry direct implications for individual and societal quality of life. The material cost to healthcare systems reflects the scale of the issue; for the NHS in the period between 2000 and 2010, maternity claims alone cost £3.1 billion [1], while according to CRICO Strategies [2] and on the basis of an analysis of national medical malpractice claims in the USA, 30% of all claims filed from 2009 to 2013 involved a communication failure: amongst those were 37% of all the high-severity injury cases and 34% of all the obstetric cases, which is the context discussed here and in the rest of the issue too. The direct relationship between team mis/communication and preventable harm is by now, firmly established therefore, and improving team communication in particular is an identified priority for quality of care and patient safety for health systems around the world.

Teams are the foundation stone of secondary care; multiprofessional medical teams in particular carry the necessary experience and skills for the complex modern hospital system. This however is not adequate, in and by itself, to make a group of skilled professionals to operate as a team and, in turn, the team effective. The vast teamwork literature has shown that an expert team is much more than a team of experts. Successful teams are more than a sum of their parts and even then, they may fluctuate in performance [3]. The technical skills in a team do not predetermine the team performance as medical and social science research has repeatedly shown [4,5].

Teams interact to distribute tasks, negotiate a working rhythm, and establish a relationship between themselves and the patient, all of which are critical components of their clinical performance. In short, the clinical outcome is emergent in and through this interaction process.[1] Teams *do* their professional role through mobilising all the resources available to them. Despite this, the way interaction is framed in medical training and in the literature is either too narrow or broad and fuzzy, and it is indicative of the issue that teamwork and team communication are perceived and treated separately.

Further on this, effective communication is not yet translated into working practice [6]. The gap is acknowledged by the Royal College of Physicians [7], who state that 'unfortunately, in medicine, effective communication and teamwork is often assumed and training in this area not prioritised' (p. 2). This can be partially attributed to the fact that communication has been traditionally considered as one of the 'soft' or 'non-technical skills' of medical practice, in contrast to the medical science and physical examination skills considered 'central' to training. The dichotomy between technical (hard) and non-technical (soft) skills is problematic [8] as it implies a hierarchy of significance; the metaphor 'hard vs. soft skills' carries strong every day connotations and perpetuates dominant ideals about what is more valid and important. Some change is currently noted as attention is drawn to integrating communication skills as a core component of training; the British Medical Association, for instance, includes, in its ethics toolkit for medical students (updated in 2020) a component on 'good communication as a medical student' [9], while recommendations are also provided in a recent consensus statement on an updated core communication curriculum for the UK undergraduate medical education [10].

Our work aims to contribute to this agenda and provide evidence-based interactional recommendations in the obstetric context. We suggest that the way communication is framed and operationalised in medical curricula can be enhanced and interdisciplinary research is particularly relevant to this end. Our research work has shown that work under healthcare sociolinguistics, the branch of linguistics that looks into the relationship between *language use as embodied practice* at the level of individual speakers and the specific characteristics of medical professional contexts, can complement medical research for understanding the specific behaviours of how effective teams interact and how those findings can be translated to teachable behaviours through existing or new tools.

[1] We favour the technical term *interaction* in the paper where appropriate; as *communication* carries a range of first order meanings (the lay use of the term), it is inflated and less useful for theoretical and analytical purposes.

The aim of this paper is, accordingly, twofold: we (a) provide a brief overview of the limitations in current tools and approaches aiming to help healthcare professionals to develop 'communication skills' and (b) show in practice how sociolinguistic healthcare research can be translated and make a solid contribution to medical research and training. We draw on our ongoing work and we illustrate our core position through examples from a large project on the management of obstetric emergencies.

The paper is organised in three parts: we start by reviewing existing communication models in the medical literature, turn to the role of sociolinguistic research in healthcare drawing on our study as an illustration, and conclude by translating our findings into teachable behaviours.

Communication models from a healthcare sociolinguistic lens

A brief review of widely used communication and information transfer models can succinctly illustrate the issues raised earlier. Contemporary attempts to systematise aspects of communication include the Relationship: Establishment, Development and Engagement *(REDE)* model of healthcare communication [11], the Plain Language, Engagement, Empathy, Empowerment, Respect *(PEEER)* model of effective healthcare team-patient communications [12], and the Begin with non-verbal cues, Establish information gathering with informal talk, Support with emotional channels, Terminate with positive note *(BEST)* communication model [13]. An increase is noted in models that attempt to codify more aspects involved in the way we interact, such as embodied cues. Gupta, for instance, draws emphasis on non-verbal cues using the acronym *SOFTEN*: Smile, Open arms, Forward lean, Touch with arm, Handshake, Eye contact, and Nod [13].

Communication models draw on sound principles; however, they typically take a structural approach and do not account for the dynamics of interaction in practice, the relationship between each of their components and the multiple forms they take in real practice. As teams interact, they manage the interactional floor in a dynamic way; each speaker creates the context and conditions for the next, and the interactants draw on their perception of what is expected, allowed and appropriate in their own setting. A holistic and nuanced approach to interactional accomplishment needs to feed into and help develop models with greater applicability in actual practice. As an illustration, recommendations such as the *Establishment* component of the *REDE* model which includes 'build rapport' and 'negotiate and set agenda' are not interactionally straightforward; the linguistic behaviours and process by which those can be achieved are not, and cannot be, specified outside the context of specialties and of discrete individuals and teams that have their own expectations and historicities. In short, although models attempt to codify and breakdown aspects of interaction simultaneously and in order to achieve universal relevance [relevance across specialties], they typically remain descriptive at a high level.

Healthcare sociolinguistics research has shown the importance of local factors, with the context and environment – material and social – of the teams playing a central role in the interaction process. Teams that work together over time are and need to be treated differently to ad hoc formations; multiprofessional teams are different to same professional teams and so on. Abstract taxonomies cannot capture the dynamic nature of interaction in specific contexts and accordingly are limited in improving the understanding of processes and in situ negotiation of good practice.

Further on this, lack of discussion of the evidence that feeds into components of models, and, at times, the accuracy of the claims, is an area where interdisciplinary work can bring immediate and direct benefits to the robustness of observations and teachability of behaviours as we show in this paper. Claims such as 'more than two-thirds of face-to-face conversation is based on body language' [13] perpetuate lay myths but are not supported by interactional research evidence. Note that if this claim was true, we would need a unit to measure meaning in verbal vs body language which cannot exist as the two are inseparable. It would also suggest that face-to-face interaction is richer than other forms which could also not explain why our conversations on the phone or in the dark are also fully complete without anything missing. Myth busting around communication, in all the meanings of the

term, and solid evidence on how expert teams in different specialties and professional environments interact is urgently needed to improve models; more broadly however, it is necessary in order to reframe 'communication' in the perception of medical professionals who have been trained to divorce interaction from their other practice.

Detailed and systematic evidence from interaction analysis can also feed into widely known information sharing tools, notably *SBAR*, Introduction, Situation, Background Assessment, Recommendation *(ISBAR*), Identify, Situation, Observations, Background, Agreed plan, Read back *(iSoBAR*), and so on, all of which aim at systematising intra-team interactions. These tools are shown to improve team performance. However, they are not used consistently and often not by the majority [14] and when they do, the gap in pinning down the exact linguistic behaviours involved in all the stages of those tools remain unaddressed. The same applies to tools that propose structures for managing the interactional floor in team interaction, such as closed-loop communication (CLC). Medical research on CLC [15] is very useful in corroborating the issues healthcare sociolinguistic research has raised. In more detail, CLC, in its basic formation, proposes organising turns in stages [speaker 1 issues message - speaker 2 confirms message - speaker 1 follows up/closes the loop] and there is indeed evidence that the use of tools for structuring interaction in ritualised, and hence predictable, forms improve team performance [16]. The sequence of messages: directed-acknowledged-executed-confirmed is also reflected in our data of good practice. Recent literature on CLC, however [17], suggests that (a) real-life CLC is substantially different to textbook CLC, with the latter being more explicit and structurally unnatural and (b) that different groups and teams have different expectations 'regarding the content, timing, and generalised structure of information transfer and may not grasp the roles and priorities of other groups' (p. 5) [18]. These two points highlight the reason why improving team interaction needs to be context sensitive and applicable to real-life care.

To sum up, we have argued that we need a different paradigm to study the nuances of team interaction and propose models and training approaches. On that front, work in healthcare sociolinguistics and the associated methodologies have a lot to offer to medical research, medical training, and tools. Although the medical encounter is accomplished in and through language as embodied practice [19], linguistic work and healthcare practice remain unbridged with the former being 'conspicuously absent from the mainstream of medical education, health communication training, and even the medical or health humanities' (p. 1) [20]. There is currently a body of work moving towards this direction showing how linguistic approaches can improve our understanding of patients' lived experiences of chronic diseases [21], feed into communication training [22], and revise the existing diagnostic tools [23]. Recently, Udvardi also looked at the role of linguistics in improving the evidence base of healthcare communication, underlining the importance of integrating qualitative linguistic analyses in future health communication research [24]. We return to this at the end of the paper. In closing the discussion here, all the tools we reviewed make a positive contribution to turning professionals' attention to the way they organise, communicate, and acknowledge activities in their team. However, in the current form, they remain focused on structural taxonomies which can be improved by a nuanced and sophisticated understanding of healthcare teamwork across specialties. We show how a sociolinguistic lens can provide in depth understanding in the next section.

The role of sociolinguistic research in providing evidence-based recommendations – a worked example

Context and methods

We report here on an observational study, which draws on a sub-set of video recordings from the *Simulation $ Fire-drill Evaluation* study (*SaFE*). The *SaFE* study was a randomised controlled trial of

training for obstetric emergencies, which took place in six sites in the UK. The participating teams, 24 in total (and a total of 140 participants), were video recorded managing *eclampsia*. The teams, consisting of a senior doctor (SD), a junior doctor (JD), two senior and two junior midwives (SMs and JMs, respectively), did not know the nature of the emergency before entering the room. The scenario involved a patient-actor who was instructed to have a seizure for about 1 min, starting 1 min after the end of the first handover (for a detailed account of the *SaFE*'s design and methodology see Ellis et al., 2008; Siassakos et al., 2010) [4,25]. The data were analysed for the clinical performance by medical professionals, while the interaction was analysed by healthcare sociolinguists. The researchers were blind to each other's findings.

The clinical assessment of the teams was based on standard clinical criteria, the most important of which were found to be the success in obtaining, preparing, and administering magnesium sulphate, and the time interval to the administration of the magnesium sulphate [4]; a six-level taxonomy was applied differentiating between high clinical performance (magnesium administration in <5 min; 5–6 min; and >6 min) and poor clinical performance (magnesium not obtained; magnesium obtained but not drawn; magnesium drawn but not administered).

In parallel, the data were analysed for the interactional dynamics and the ways in which the teams manage the interactional floor through an established sociolinguistic framework, namely interactional sociolinguistics (IS). IS focuses on the analysis of situated real-life encounters and connects the patterns to the organisational context within which professionals operate. The IS framework provides valuable methodological tools for exploring interactions between participants with varying degrees of institutional status and power. This makes it particularly appropriate for the study of ad hoc multidisciplinary obstetric teams, in which staff members with different backgrounds and from various seniority levels come together temporarily. Recent IS work also makes a case for the relevance of the framework for a critical study of professional interaction [26]. IS, in line with established approaches for interaction analysis, such as conversational analysis (CA), conceptualises space and speech as intertwined and interactively achieved. This is particularly relevant for the analysis here: interaction is understood as embodied performance and staff members use all verbal resources and the material space of the emergency room as part of *doing* their role.

To illustrate our methodology and its appropriateness for identifying patterns and feeding into medical training, we zoom in on how teams manage tasks in their context. Task management is a key process in the emergency encounter and, more broadly, in the way in which teams deliver care and transfer responsibility and accountability in inter/intra-team handovers. For instance, task allocation is a core part of SBAR (under *Recommendations*) and the other widely used healthcare communication models [e.g., under *Agreed plan* in *iSoBAR*]. Previous work has indicated the significance of task management as a leadership function and demonstrated its link to performance [27,28]. This is directly relevant in our context, in which the effective management of eclampsia requires the coordination and synchronous performance of multiple tasks, including placement in the recovery position, administration of oxygen, sampling of venous blood, and the administration of magnesium sulphate [29]. Task management in the form of allocation and decision on task sequencing is critical for the management of an encounter and for decisions when clinical teams hand over responsibility. We pay particular attention to the role of the senior doctors, as they are usually (but not exclusively) the ones managing the team and initiating/coordinating the tasks. We show the systematicity of the patterns, the applicability of the findings, and the discrepancy with textbook approaches to team communication. We now turn to repositioning interactions in their situated, in time, place, and moment, context.

Interaction as embodied practice

The analysis of the video recordings through a multimodal lens has resulted in the identification of the following three core material *zones* in the obstetric room: (1) the area around the bed, and particularly the bedsides; (2) the equipment table; and (3) a zone out of the room. These are illustrated in Fig. 1 below which depicts the obstetric room in which our teams work. By monitoring the position of each professional in the room every 30 s or so, as well as the key actions/task performed, we then mapped the use of each zone with the various professional roles.

Fig. 1. Identified material zones in the emergency room.

The physical environment and the ways in which it is embodied by professionals constitutes part of *situational awareness*, a vastly discussed concept in the medical literature under the umbrella term of *human factors* [30]. Despite the extensive discussion on human factors in healthcare, however, the term still remains ambiguous, with some of its aspects, such as the physical environment and interactions with equipment, being overlooked [31]; we demonstrate below our methodology for addressing some of these aspects in the data that follow.

Our analysis yielded systematic patterns in regard to professionals' preferred material zones, which we have visualised in Fig. 2 below.

As illustrated in Fig. 2, senior doctors control the centre of the room, positioning self around the bed, and primarily at the bedsides. Turning to the senior midwives, one of them acts mostly at the equipment table and the other one at one of the bedsides, and, less frequently, they exit the room. As for junior midwives, those exhibit a clear tendency to stay close to the equipment table and are the ones who exit the room most frequently in order to retrieve things, while one of them also maintains a bedside role, passing crucial information to the team. The junior doctors have not been included in Fig. 2, as they appear more fluid in the data; we have provided different readings on this in earlier work [32,33].

As follows, the senior doctors are the only ones consistently occupying material zones around the bed (hence closer to the patient). Positioning in the centre of the room, thus, also positions them in the centre of the action and is part of *doing* their professional role; this is illustrated by the ways in which senior leaders are expected to take this position and deviations create *interactional trouble,* a term used to denotate a breakdown in the management of the interactional floor. We elaborate on the significance of this trouble in light of the data below.

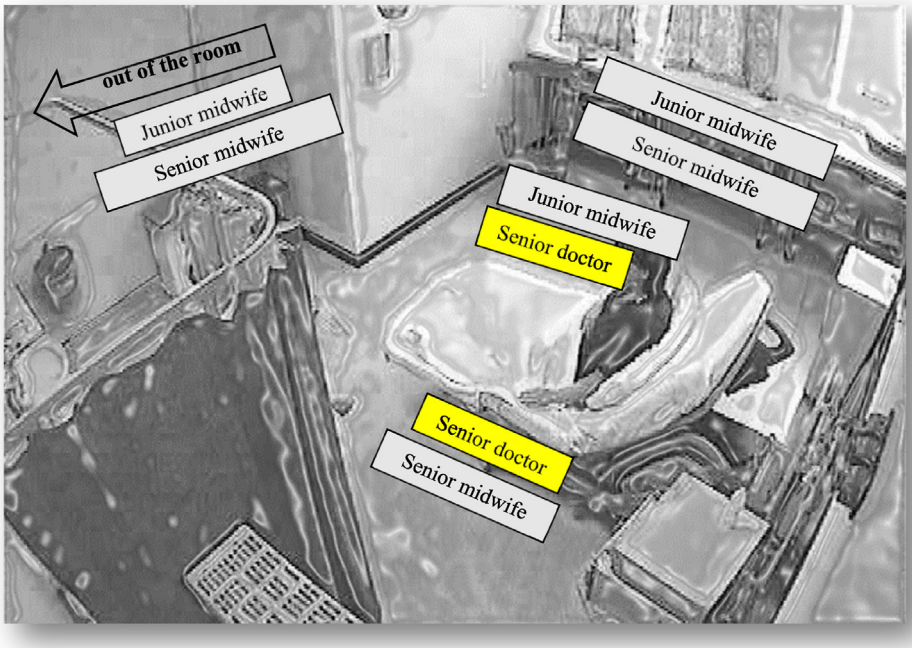


Fig. 2. Mapping professional roles on the material zones of the emergency room.

Looking into the work of medical teams from an interactional angle

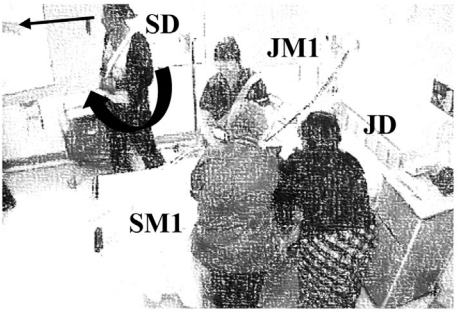
Research in healthcare sociolinguistics has shown the systematicity in the *sequence* and *design* of linguistic structures in the process of managing a complex medical task. Teams that perform well, in terms of clinical outcomes, tend to follow the same patterns of the encounter in our projects. Teams have been analysed interactionally for the use of common linguistic devices, such as questions, as well as smaller features, e.g., overlaps and interruptions. The relationship between the team leader's style and the teams' linguistic behaviour has been noted in the linguistic literature and anecdotal observations are also found in medical studies. Our aim here is to show the implications for medical training on the basis of what IS tools can deliver. We use task management as our main angle for discussing the work of teams with high and low clinical performance. We show the relationship between interactional trouble and overall performance in the data and make a case for the teachability of specific linguistic practices. The two examples below illustrate stable patterns in our dataset and are representative of the systematicity we note in the analysis.

Teams with high clinical performance

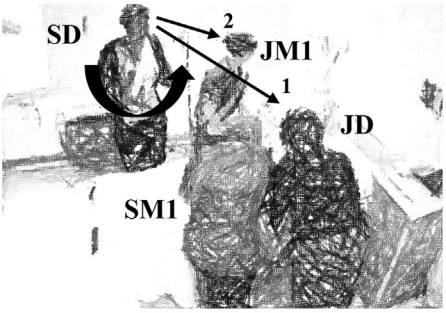
Excerpt 1 is drawn from a team with high clinical performance, in which staff members administered magnesium within 5–6 min. The senior doctor enters the room and, as soon as she is updated on what is happening, she manages the team by allocating and confirming tasks, as shown below. Her position at all times is in the zones that have been systematically associated with doing leadership and control in our data.

Excerpt 1.[2].

Instance 1



Instance 2



task confirmation

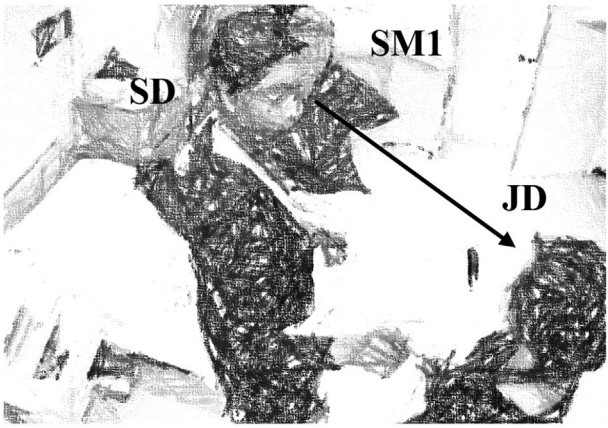
1	SD	okay blood pressure now↑ are we
2		getting the mag sulf sorted out↑
3	SM2	[mag sulf's being drawn up now
4		(.) it'll be ready in a couple of
5		minutes
6	JM2	[yeah (.) it's being drawn up

task confirmation

7	SD	are you gonna put the magnesium
8		sulfate off THERE are you↑
9	JD	-ye:ah
10	SD	great (.) ((few lines omitted))
11		and you Zi (.) if you could start drawing
12		up the infusion↑ (.) [again er
13	JM1	[yeah OK
14	SD	a gram an hour

task allocation

Instance 3



19		((few lines omitted))
20	SM2	right (.) mag sulf is [going in now (.)
21		okay↑
22	JD	[o- (.) what [was
23		the O2 stats↑
24	SD	[OK
25		can you write [that↑
26	JD	[what was the-
27	SD	-CAN
28		you write that down (.) mag sulf↑
29	JD	right

task allocation

In Instance 1, the senior doctor allocates/confirms the task of magnesium's preparation by using a common, and successful structure in our data, namely a yes/no question (*are we getting the mag sulf sorted out*↑, lines 1–2). Yes/no questions are used by team leaders for issuing directives in our data, as such questions tend to restrict the respondents' possible uptake; to deviate from the senior doctor's directive here, staff members would have to produce a *no*-prefaced response which would be considered a direct disagreement which is rare and dispreferred in professional discourse. Although the senior doctor uses the collective pronoun *we*, she addresses certain staff members in an embodied way: in raising the question, she turns her torso and shifts towards the equipment table, which is the

[2] The line arrows in the excerpts indicate gaze direction and the curved arrows mark turn of the torso. Transcription conventions are provided in the Appendix.

designated material space for the preparation of the magnesium sulphate; junior midwife 2 and senior midwife 2 are the only members standing there (not shown in instance 1). The senior doctor's embodied behaviour successfully opens the floor to those two members and in lines 3–6, and junior midwife 2 and senior midwife 2 are the only members responding in the affirmative. The use of 'Yeah' in turn initial position (line 6) explicitly shows alignment with the previous turn in its canonical form.

As soon as the senior doctor confirms the magnesium's preparation in the equipment table, she proceeds to allocating the task of its administration by raising, again, a yes/no question (lines 7–8). As shown in Instance 2, the senior doctor has returned in the right bedside and looks directly at the junior doctor, targeting her as the only addressee, while briefly raising her voice's volume and repeating part of the question. A brief raise in the volume is an effective tool for claiming the floor, while repetition is a useful strategy for intensifying directives without this always involving full repetition of earlier turns (cf. textbook CLC examples); both strategies are consistently mobilised by senior doctors in the data. As soon as the senior doctor receives confirmation, she swiftly moves to the next task allocation, and this time to the junior midwife 1 (lines 11–12); the task allocation is again, uttered with a rising intonation and targets a specific addressee both verbally (*and you Zi*) and in an embodied way, as she turns her gaze to junior midwife 1. In both instances, the management of the floor is successful as in the next turn only the targeted addresses (JD in line 9 and JM1 in line 13) respond in the affirmative, without evident interactional trouble (i.e., interruptions, overlaps, delays, etc.).

Moving on, Instance 3 is an illustrative case of how senior doctors mobilise the aforementioned strategies to control the floor and demonstrate leadership. In lines 22–25, the junior doctor and senior doctor overlap as the first raises an information-seeking question about the oxygen saturation (lines 22–23), while the latter asks the junior doctor to write down the magnesium sulphate count using, again, a yes/no question to allocate the task: *OK can you write that*↑. The junior doctor briefly continues fighting for the floor and attempts to re-introduce the topic of the oxygen with another incomplete question, in line 26; the senior doctor, however, interrupts her again repeating her question (lines 27–28). This time, she also raises her voice's volume (*CAN you write that down (.) mag sulf*↑) while she maintains eye contact with the junior doctor and makes a relevant gesture pointing to the equipment table where the junior doctor should right down the count. The interruption, the yes/no question which normatively requires a positive response, the raised volume as a floor-taking mechanism, the repetition to intensify the directive, the eye contact and the pointing gesture, all contribute to the senior doctor successfully allocating the task, as the junior doctor finally quits her turn responding in the affirmative, in line 29.

Overall, what can be extracted from Excerpt 1 is the senior doctor's consistent use of questions for allocating (lines 7–8, 11–12, 25, 27–28) and confirming (lines 1–2) tasks. The format of the questions exhibits systematicity throughout the excerpt (and the whole dataset), too, allowing for the senior doctor's control of the floor and, ultimately, the situation; uttered in a yes/no format, such questions privilege a short – and positive – response, while, at the same time, the senior doctor briefly raises her voice's volume to manage the floor when required, and uses repetition to intensify the directives. These task allocations normatively target specific members both verbally and in an embodied way (i.e., eye contact). In doing so, the senior doctor mostly positions self at the right bedside, the team leader's identified material zone, which allows for an overseeing role (see Fig. 2), briefly moving to other material zones relevant to the requested tasks (Instance 1). The team's uptake throughout the excerpt illustrates that team members recognise and re-affirm the senior doctor's dominance, as they swiftly correspond addressing her requests (lines 3–6, 9, 13, 29), without evident interactional trouble.

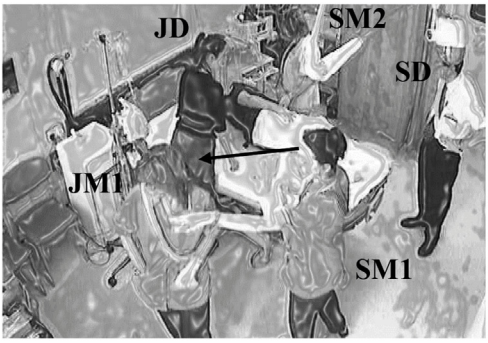
These are behaviours observed across teams with good clinical performance in the dataset. Equally, as illustrated below, teams with poor clinical performance consistently deviate from the above patterns, which further strengthens our case for the relationship between interactional and clinical performance; we elaborate on this in the discussion.

Evidence in teams with poor clinical performance

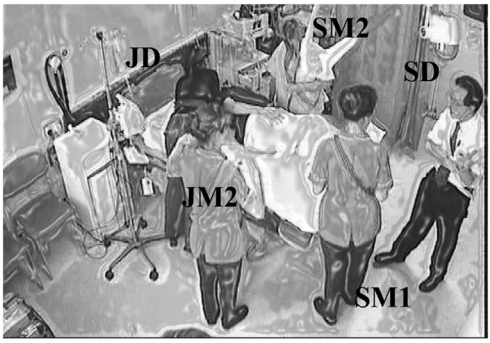
Excerpt 2 is drawn from a team with poor clinical performance, where staff members obtained the magnesium but did not prepare – and thus did not administer – it. To allow for a comparison with Excerpt 1, we focus again on the task allocation.

Excerpt 2.

Instance 1



Instance 2



1	SD	right (.) if we could write down the	8	SD	e:hm (.) is she:: [(indec)
2		pressure (.) hm (.) (3.0) **long pause**	9	SM2	**interruption** [what's the CTG doing
3	SM1	OK (.) if you could record the blood	10		plea:se↑
4		pressure you're in charge over	11		*THE CTG IS NORMAL*
5		there	12	SM2	the CTG is normal (.)
6		((2.0 overlaps))	13	SD	e:hm she:'s [(indec)↑
			14	SM2	[fetal heart↑
			15		**interruption** *130*
			16	SM2	130 thank you:

Excerpt 2 begins with the senior doctor's attempt to allocate a task similar with the one in Excerpt 1 (lines 25–28): *if we could write down the pressure*. In contrast to the senior doctor's linguistic behaviour in Excerpt 1, however, the senior doctor here does not raise a straight yes/no question, while he also fails to target a specific member verbally or multimodally, using the collective pronoun *we* without making eye contact with anyone. In terms of his position in the room in relation to the identified material zones, the senior doctor stands in a peripheral zone, at the corner of the bed, maintaining some physical distance from the bed comparing to the junior doctor and the senior midwife 2, who occupy a central position at the bedsides (cf. Fig. 2). Note also, the senior doctor's hesitation and minimisation of the impact of directives, in lines 1–2, including a string of short pauses and a hesitation marker (*hm*) as well as the use of 'if' which mitigates his directive. The 3-s pause in line 2 indicates the impact of the less assertive linguistic design. Long pauses are rare in this emergency context, and here none of the present staff members takes responsibility for the requested task. In lines 3–4, the senior midwife 1 steps in and allocates the task directly to the junior midwife 1 in the following ways: she shifts closer to the junior midwife and points to the equipment table (zone 3 in Fig. 1), where the recording will take place, while directly talking to her and explicitly allocating the responsibility to her: *you're in charge over there* (lines 4–5). This attempt is successful, as the junior midwife 1 immediately transitions to the equipment table to record the patient's blood pressure.

Moving forward, in Instance 2, the senior doctor tries again to claim the floor by raising a question; as in the previous instance, though, his intervention includes hesitation markers (*e:hm*), elongated

vowels (*e:hm*; *she:*) and a short pause, while also retaining his physical distance from the bed and having his arms crossed – a hand gesture prototypically associated with insecurity/defensiveness. Being away from the bed for a senior doctor limits the ability to monitor the centre of the action and also deviates from the professional expectations of where senior leaders stand.

The combination of those factors creates the context for the senior midwife 2, in line 9, to interrupt. The senior midwife gains the floor and raises an information-seeking question on the CTG; as soon as she receives the answer and confirms it, the senior doctor attempts again to re-introduce his question (line 13). Once again, his mitigation results in another interruption, again by the senior midwife 2, who raises another information-seeking question, this time relevant to the foetal heart rate (line 14). Overall, interruptions, particularly from junior to senior members, cause breakdowns in the interactional floor which, in turn, can hinder the information flow; uninterrupted information transfer is critical in the emergency context, with our findings consistently demonstrating that teams that control well the interactional floor also exhibit good task management and a strong clinical performance.

The senior doctor appears to have difficulty in allocating tasks and managing his team; the lack of complete yes/no questions and the mitigation throughout his turns, combined with his body language and his position in a peripheral material zone, lead to uncertainty which filters through the team, documented in the team's long pauses (line 2), overlaps (line 6, 9, 14), and interruptions (lines 9, 14).

Zooming out from the examples, the pertinent matter is how we move from microanalysis to wider claims useful for (obstetric) teams at the frontline. First, team movement in their material space; team movement and verbalisation are inseparable ingredients of task management. Our data suggest that good teams have little movement out of their designated zones and display less agitation compared to weaker teams. Fig. 3 shows the recommended material zone for team leaders (in our case, senior doctors) handling obstetric emergencies as emerged in the study of the *SaFE* data.

Positioning in space is a resource for teamwork and role enactment as we have shown; the patterns we reported here are consistent with our findings from an ongoing large ED project providing

Fig. 3. Recommended material zone for *SaFE* team leaders.

robustness that makes them solid foundation to draw implications from moving from local to broader relevance.

Moving further, the patterns we observe also translate to specific linguistic behaviours that are trainable and can enhance existing information sharing modules and tools such as CLC. In our work, our findings have been well received by clinical teams in obstetric and ED contexts, and the feedback shows that examples from everyday practice are powerful mechanisms for teams to relate and see the immediate difference in practice. Table 1 provides a succinct example of strategies that emerge from our data. Our sociolinguistic work of the last 15 years corroborates the literature and indicates that training in structuring, sequencing, and designing interaction can provide valuable tools to professionals who operate under pressure in high-risk, high-stakes medical contexts. We discuss this further in the next and final section of the paper.

Discussion

Our research shows that teams do teamwork in and through an emplaced/embodied interactive practice and negotiate their roles and coordinate in situ. Our work [32,33] on the management of obstetric emergencies shows that teams with strong clinical performance tend to declare the emergency, do direct task allocation, and maintain tight control of the floor, including only task-related

Table 1
Implementation for clinical practice in obstetric emergency contexts.

Identified strategy	Recommendations			
	Dos	Example	Don'ts	Example
Positioning in the material space	✓ Maintain a central position that allows for an overseeing role.	Ideal position marked in Fig. 3	✗ Avoid moving around excessively without a reason.	
	✓ Consider briefly shifting to the space relevant to the task at hand if you need to coordinate/ initiate it.	Equipment table for the preparation of the magnesium (Instance 1, Excerpt 1)	✗ Avoid staying long in unexpected spaces or spaces where you are not visible by the team.	Near the door; next to the equipment table; out of the room. e.g., Instance 3, Excerpt 2
Use of questions	✓ Use questions for allocating tasks, as they can elicit instant confirmation (resulting in a form of closed-loop communication).	*Can you write that down?* (lines 27–28, Excerpt 1)	✗ Avoid leaving a question 'hanging'/ incomplete, as it can be ignored and/or delay the team.	*e:hm (.) is she::?* (line 8, Excerpt 2)
	✓ Target a potential addressee through use of names, gaze direction, moving closer to someone etc.	*and you Zi (.) if you could start drawing up the infusion* (+direct eye contact; lines 11–12, Excerpt 1)	✗ Avoid questions that do not specify an addressee, unless they are indeed targeted to the whole team.	*if we could write down the pressure* (+no eye contact), (lines 1–2 in Excerpt 2)
	✓ Use *yes*/*no* questions where possible.	*Are you getting the mag sulf sorted out?*	✗ Avoid indirect requests, as it is easier for those to be left unanswered.	
	✓ Repetition and brief raise of volume could accelerate the performance of the requested task.	lines 27–28, Excerpt 1	✗ Avoid repeated pauses, hesitation, and stretched vowels, as they often result in interruptions and overlaps.	Instance 2, Excerpt 2

The table provides a useful digest and can be also associated with making the use of information protocols such as SBAR more consistent.

(meaningful) movement and articulate critical information for the stages of the emergency. Participants in teams with strong clinical results orient towards CLC forms of managing the encounter. However, they appear to favour shorter linguistic structures compared to textbook examples of what good communication looks like and to be more succinct. These findings extend our earlier work [29] which has shown that consistent use of tools that encourage the structuring of information in stable and hence recognisable sequences, such as SBAR and CLC, were associated with better team performance [16] also from a patient-actor perspective [34].

Further, we argued that separating clinical and interactional practice is artificial and damaging for understanding of the latter. The same applies for conceptualising interaction as 'soft' or different in nature to 'hard' skills. We have shown that interaction is technical and sequentially systematic; it involves detailed use of verbal and material resources available to the interactants and can be improved through training. By controlling the interactional floor, the senior doctor in Excerpt 1 controls the team and its clinical outcomes, with the team scoring high in clinical efficacy. Equally, the senior doctor's trouble in managing the team and allocating tasks, in Excerpt 2, is an inseparable part of the team's lower clinical performance. Further on this, interactional trouble (Excerpt 2) never occurs in a vacuum; it is part of the work interactants do in a situated encounter. Although not all teams with low clinical performance go through interactional trouble, all the high-performing teams exhibit tight control of the interactional floor and smooth management of the tasks they need to distribute and carry out.

We further demonstrated that the role of positioning in the material space is part of professional performance and we made a case for shifting away from a verbal-only understanding of interaction which is the dominant praxis in conceptualisations of 'communication' in the medical literature. As a turn to the role of the body in understanding medical teamwork is growing, it is an opportunity to reframe our

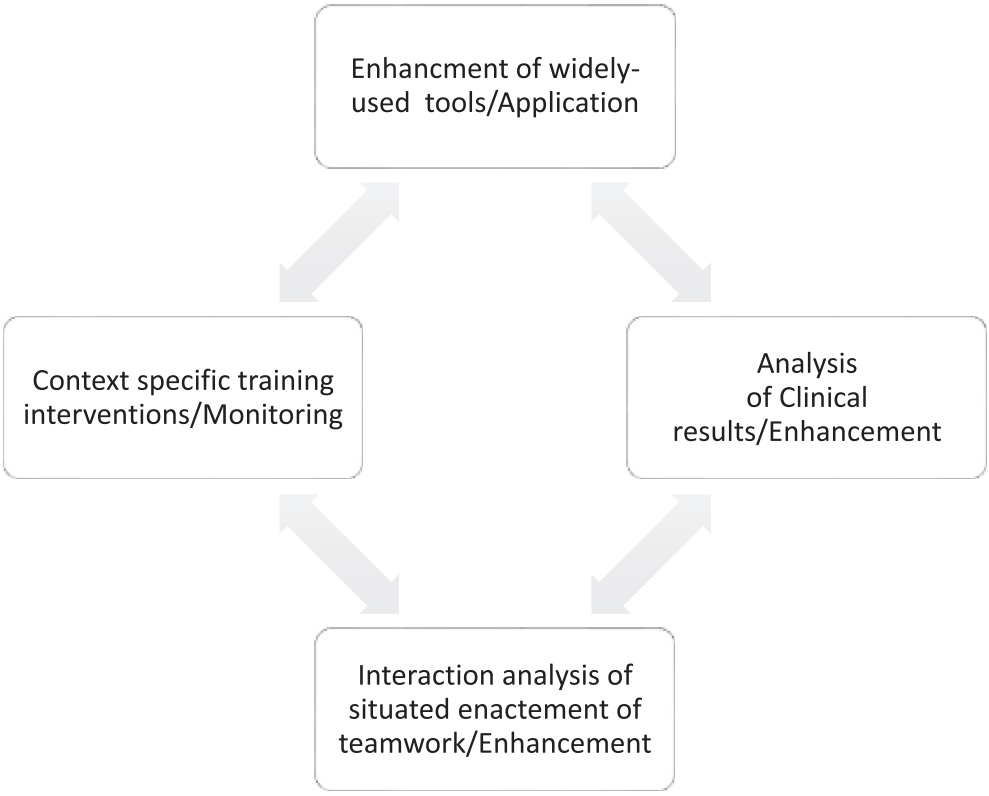


Fig. 4. A framework for the implementation of training interventions drawing on sociolinguistic research.

understanding of medical 'communication' too. A holistic understanding of teamwork practice, involving interaction as an inseparable component, needs to become core part of medical research and training. Current training approaches are typically based on narrow models and do not address the dynamics of interaction in situ. Models from other contexts, notably aviation, cannot provide us with a holistic understanding of the teamwork processes in obstetric emergencies, which is our focus, but in other specialties too. As we have argued elsewhere, training interventions for professionals need to draw on a systematic, ideally multimodal analysis of interaction such as the one we have illustrated here [26]. A context-sensitive analysis of medical practice and a specific focus on the characteristics of the different specialities and settings is a necessary condition for the generalisability of models to be applied and tested.

To conclude, on the basis of our current and earlier work, we propose a framework for implementing training interventions based on the analysis of performance in clinical practice bringing together medical and healthcare sociolinguistic research (see Fig. 4).

A progressive move from Department > Trust > National > Global contexts is useful in implementing findings and also informing training programmes available for multiprofessional teams. The framework is a visual illustration of the process in which evidence-based interventions can be designed and delivered and also indicates the potential of the interventions to translate to training, be measured locally, and introduced more widely. On this, the methodological framework we propose, IS, is enabling insights into the ways in which teams organise their work, establish a rhythm, and deliver their clinical tasks. It is a framework and a tool that is widely unknown to medical research but which has a lot to offer. As qualitative research is growing in healthcare research, innovating in methodology enables us to combine healthcare analysis with the tools of other disciplines that address relevant/complementary questions. This can provide more layers of meaning to the medical professionals' tools for organising and designing team management and ultimately enhancing clinical outcomes and by extension improve patient safety.

Summary

Good teamwork can improve patient safety as well as improve the patient experience. Unpacking the dynamics of interaction is a core part of this process. In order to produce new knowledge though we need to examine further clinical care in real contexts, frontline/simulations/narratives and analyse the data through various lenses to capture the complexity of team performance. We have argued that a joint medical and healthcare sociolinguistic research agenda can make a contribution to this complex phenomenon and we hope further research will continue exploring team interaction in real life.

Practice points

- Teamwork and team communication are intertwined and should not been treated separately.
- The material space is a core part of interactional dynamics.
- Interdisciplinary research is needed to understand the dynamics of team interaction.

Research agenda

- Teamwork in real-life contexts needs to be further examined.
- Healthcare sociolinguistic and medical research can complement research on teamwork.
- Material place and interactional analysis need to be embedded in medical research.

Declaration of competing interest

The authors have no conflicts of interest.

Appendix

Transcription conventions.

[	Overlap onset.
(.)	Pause shorter than 0.5 s.
(X.0)	Pause about X seconds.
((.))	Notes.
–	Interruption.
:	Sound stretching.
(word)	Uncertain transcription.
↑	Questioning intonation/rise in pitch.
emphasis	Emphatic speech.
LOUDER	Voice volume louder than surrounding speech.

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References

[1] NHS Litigation Authority. Ten years of maternity claims an analysis of NHS litigation authority data. 2012. Report, https://resolution.nhs.uk/wp-content/uploads/2018/11/Ten-years-of-Maternity-Claims-Final-Report-final-2.pdf. [Accessed 15 September 2021].
[2] Strategies Crico. Malpractice risks in communication failures. 2015 annual benchmarking report. 2015. https://www.rmf.harvard.edu/Malpractice-Data/Annual-Benchmark-Reports/Risks-in-Communication-Failures. [Accessed 15 September 2021].
[3] Reyes DL, Salas E. What makes a team of experts an expert team? In: Subotnik RF, Olszewski-Kubilius P, Worrell FC, editors. The psychology of high performance: developing human potential into domain-specific talent. American Psychological Association; 2019. p. 141–59. https://doi.org/10.1037/0000120-007.
[4] Siassakos D, Draycott T, Crofts J, Hunt L, Winter C, Fox R. More to teamwork than knowledge, skill and attitude. BJOG An Int J Obstet Gynaecol 2010;117:1262–9. https://doi.org/10.1111/j.1471-0528.2010.02654.x.
[5] Krage R, Zwaan L, Tjon Soei Len L, Kolenbrander MW, Groeningen D, Loer SA, et al. Relationship between non-technical skills and technical performance during cardiopulmonary resuscitation: does stress have an influence? Emerg Med J 2017;34:728–33. https://doi.org/10.1136/emermed-2016-205754.
[6] Nursing Times. Comment: 'Communication: an essential skill in healthcare'. 2017. https://www.nursingtimes.net/opinion/comment-communication-an-essential-skill-in-healthcare-01-12-2017/. [Accessed 25 September 2021].
[7] Royal College of Physicians. Improving teams in healthcare resource 3: team communication. 2017. https://www.rcplondon.ac.uk/projects/outputs/improving-teams-healthcare-resource-3-team-communication. [Accessed 3 December 2020].
[8] Nestel D, Walker K, Simon R, Aggarwal R, Andreatta P. Nontechnical skills: an inaccurate and unhelpful descriptor? Simulat Healthc J Soc Med Simulat 2011;6(1):2–3. https://doi.org/10.1097/SIH.0b013e3182069587.
[9] British Medical Association. Ethics toolkit for medical students: good communication as a medical student 2020 (updated in 2020), https://www.bma.org.uk/advice-and-support/ethics/medical-students/ethics-toolkit-for-medical-students/good-communication [accessed 27 November 2021].
[10] Noble LM, Scott-Smith W, O'Neill B, Salisbury H. Consensus statement on an updated core communication curriculum for UK undergraduate medical education. Patient Educ Counsel 2018;101(9):1712–9. https://doi.org/10.1016/j.pec.2018.04.013.
[11] Windover AK, Boissy A, Rice TW, Gilligan T, Velez VJ, Merlino J. The REDE model of healthcare communication: optimizing relationship as a therapeutic agent. Journal of patient experience 2014;1(1):8–13. https://doi.org/10.1177/237437431400100103.
[12] Conigliaro R, Kuperstein J, Dupuis J, Welsh D, Taylor S, Weber D, et al. The PEEER model: effective healthcare team-patient communications. MedEdPORTAL; 2013. https://doi.org/10.15766/mep_2374-8265.9360.
[13] Gupta R. BEST: a communication model. BMJ 2006;333:s35. https://doi.org/10.1136/bmj.333.7560.s35.
[14] Coolen E, Engbers R, Draaisma J, Heinen M, Fluit C. The use of SBAR as a structured communication tool in the pediatric non-acute care setting: bridge or barrier for interprofessional collaboration? J Interprof Care 2020:1–10. https://doi.org/10.1080/13561820.2020.1816936.
[15] Hughes KE, Hughes PG, Cahir T, Plitt J, Ng V, Bedrick E, et al. Advanced closed-loop communication training: the blind-folded resuscitation. BMJ Simulation and Technology Enhanced Learning 2020;6:235–8. https://doi.org/10.1136/bmjstel-2019-000498.

[16] Siassakos D, Bristowe K, Hambly H, Angouri J, Crofts JF, Winter C, et al. Team communication with patient actors: findings from a multisite simulation study. Simulat Healthc J Soc Med Simulat 2011;6(3):143–9. https://doi.org/10.1097/SIH.0b013e31821687cf.
[17] Marzuki E, Rohde H, Cummins C, Branigan H, Clegg G, Crawford A, et al. Closed-loop communication during out-of-hospital resuscitation: are the loops really closed? Commun Med 2020;16(1):54–66. https://doi.org/10.1558/cam.37034.
[18] Salik I, Ashurst JV. Closed loop communication training in medical simulation. Treasure Island (FL): StatPearls Publishing; 2021 [Updated 2021 Jul 26]. StatPearls [Internet], https://www.ncbi.nlm.nih.gov/books/NBK549899/.
[19] Sarangi S. Practising discourse analysis in healthcare settings. In: The SAGE handbook of qualitative methods in health research. London: SAGE; 2010. p. 397–416. https://doi.org/10.4135/9781446268247.n21.
[20] Demjén Z, editor. Applying linguistics in illness and healthcare contexts. Contemporary studies in linguistics. London; New York: Bloomsbury; 2020.
[21] Angouri, J., Mesinioti, P., Banatwalla, R., & Dimitriadis, G. Intersecting identities in health care research. In U. Flick (ed.), The SAGE handbook of qualitative research design.
[22] Slade D, Pun J, Murray K, Eggins S. Benefits of health care communication training for nurses conducting bedside handovers: an Australian hospital case study. J Cont Educ Nurs 2018;49(7):329–36. https://doi.org/10.3928/00220124-20180613-09.
[23] Semino E, Hardie A, Zakrzewska J. Applying Corpus Linguistics to a diagnostic tool for pain. In: Demjén Z, editor. Applying linguistics in illness and healthcare contexts. Contemporary studies in linguistics. London; New York: Bloomsbury; 2020. p. 99–127. https://doi.org/10.5040/9781350057685.0011.
[24] Udvardi A. The role of linguistics in improving the evidence base of healthcare communication. Patient Educ Counsel 2019; 102(2):388–93. https://doi.org/10.1016/j.pec.2018.09.012.
[25] Ellis D, Crofts J, Hunt L, Read M, Fox R, James M. Hospital, simulation center, and teamwork training for eclampsia management: a randomized controlled trial. Obstet Gynecol 2008;111:723–31. https://doi.org/10.1097/AOG.0b013e3181637a82.
[26] Angouri J. Culture, discourse, and the workplace. London: Routledge; 2018. https://doi.org/10.4324/9781351068444.
[27] Fernandez Castelao E, Russo SG, Cremer S, Strack M, Kaminski L, Eich C, et al. Positive impact of crisis resource management training on no-flow time and team member verbalisations during simulated cardiopulmonary resuscitation: a randomised controlled trial. Resuscitation 2011;82(10):1338–43. https://doi.org/10.1016/j.resuscitation.2011.05.009.
[28] Tschan F, Semmer N, Hunziker S, Marsch S. Decisive action vs. joint deliberation: different medical tasks imply different coordination requirements. In: Duffy V, editor. Advances in human factors and ergonomics in healthcare. Boca Raton, FL: Taylor & Francis; 2011. p. 191–200.
[29] Siassakos D, Bristowe K, Draycott T, Angouri J, Humbly C, Winter JF, et al. Clinical efficiency in a simulated emergency and relationship to team behaviours: a multisite cross-sectional study. Br J Obstet Gynaecol 2011;118:596–607. https://doi.org/10.1111/j.1471-0528.2010.02843.x.
[30] Parush A, Campbell C, Hunter A, Chunyun M, Calder L, Worthington J, et al. Situational awareness and patient safety: a primer for physicians. Ottawa: The Royal College of Physicians and Surgeons of Canada; 2011.
[31] Rosenorn-Lanng D. Human factors in healthcare: level one. Oxford, UK: Oxford University Press; 2014. https://oxfordmedicine.com/view/10.1093/med/9780199670604.001.0001/med-9780199670604. [Accessed 11 November 2021].
[32] Mesinioti P, Angouri J, O'Brien S, Bristowe K, Siassakos D. 'Get me the airway there': negotiating leadership in obstetric emergencies. Discourse Commun 2020;14(2):150–74. https://doi.org/10.1177/1750481319890390.
[33] Mesinioti P. 'GET the oxygen get an airway': doing leadership in medical emergencies. Coventry, UK: Unpublished PhD thesis, University of Warwick; 2021.
[34] Slade D, Manidis M, McGregor J, Scheeres H, Chandler E, Stein-Parbury J, et al. Communicating in hospital emergency departments. Berlin, Heidelberg: Springer; 2015. https://doi.org/10.1007/978-3-662-46021_4.