The characteristics of professional mental models of anesthesiologists and surgeons in the operating room – a qualitive study based on interview collecting data.

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Implication statement

Qualitative study, exploring the relationship between two specialties in the OR environment, where they tend to achieve the best surgical outcome for patient. A current lack of studies investigating specific mental models, determined the aiming to explain the complexity of this relationship and try to improve it throw a common awareness.

Abstract

Purpose Patient safety hinges on effective teamwork. Enhanced communication between Anesthesiologist and Surgeon fosters a fulfilling relational experience. Understanding each other's roles is crucial for the operating room (OR) team. Mental models facilitate the comprehension of complex situations and systems, representing internalized knowledge about theories, principles, and procedures. Bridging gaps between individual mental models promotes global teamwork, patient safety, and professional well-being. Our study provides a comprehensive summary of OR professionals' mental models and aims to raise awareness about their similarities and differences.

Methods We used a qualitative design to examine mental models and interaction between the professionals of two medical specialties. 17 semi-structured conducted interviews with 9 anesthesiologists and 8 surgeons were performed. Data analysis was performed separately by two specialists from each specialty, using a thematic analysis and comparative method to identify a list of main themes and assess differences and similarities.

Results Both surgeons and anesthesiologists recognize the importance of dialogue, trust, and expertise to best collaborate in the patient's interest. Differences emphases performance, approach to resident training, and the perception of OR hierarchy. Identifying specific mental models allowed us to delineate three main relational stressors: Time spent with patient, conflicts on hierarchy fueled by personality differences and performance over safety priorities.

Conclusion. Shared dimensions of OR professionals' specific mental models clearly catalyze a positive relational dynamic. Awareness of contrasting domains as hierarchy issues and different priorities is important as it may allow fine, targeted relational tuning.

Introduction

Teamwork is a major contributor to patient outcome. Communication gap is the most common cause of errors, adverse events, and malpractice claims for surgical patients(1). Surgeons and anesthesiologists are the key players in the operating room (OR), aiming for a common goal(2) – safety and best patient outcome. Their relationship, in each surgeon–anesthesiologist dyad, is seen as a critical element of overall team performance(3) Behind the surgical mask, they often cannot read each other's faces and access implicit communication. Quality of communication is the key for everyone to remain focused on the goal.(2)

Mental models refer to the cognitive frameworks that professionals use to interpret and understand their environment. These models are based on individual experiences, education, and training. They influence how individuals perceive and respond to different situations. For example, game theory is a mental model that helps you understand how relationships and trust work .(4) (5)   Medical mental models are particularly important because they impact professionals' decision-making and problem-solving.
There is a lack of qualitative studies investigating the factors that determine the dyad's relationship from the perspectives of patient outcome and safety. Our study aims to fill this gap by exploring mental models from anesthesiologists' and surgeons' perspectives, identifying primary goals and challenges for effective collaboration.
Qualitative research allows a deeper comprehension of personal experiences and may enhance our understanding of these concepts. Surgeons and anesthesiologists have distinct professional roles that can lead to in divergent values and motivations regarding patient care . Their medical training shaped a set of values and beliefs that align with their personal history. Haidt et al explore how the overall success of a group can lead to negative perceptions in another group(3,6) It is not surprising to encounter some dysfunction when individuals from different professional backgrounds interact. The similarity of team members' mental models or their shared understanding regarding clinical tasks is likely to influence the effectiveness of teamwork (6). Working in dyad, they do share experiences, perceptions, emotions, and common aims. To our knowledge there is no study exploring shared dimensions of mental models between surgeons and anesthesiologists.

 Shared mental models is a concept derived from high reliability environments e.g. aviation teams, used to develop collective understanding of how they will work together to safely attain their goals(7). Areas of high-risk health care like the OR have adapted this concept to improve interdisciplinary teamwork and thus improve patient outcome. Non-technical skills including communication, situational awareness, task management and leadership are employed to produce functional shared mental models. When a team uses shared mental models concept members can identify how each of them contributes to the active task. Each member uses appropriate strategies to engage and adapts to new information to ensure its completion(7). Substantially shared mental models are presumed to be the cognitive basis of the smooth and effortless coordination observed in many expert teams working in high-intensity environments such as the OR (8).

Multiple studies address the differences in the content, structure and priorities between the way doctors communicate (9) . Generally, physicians are trained to be effective and to move directly to the core of the situation. For the surgeon the process may be even more brief as they do tend to concentrate on the operating task. Fundamental differences in communication styles have been identified as impediments to cohesiveness in interdisciplinary teams and are associated

with failures in interdisciplinary communication(10). Thus, limited vocabularies and unfamiliarity with work cultures, social norms and hospital processes can hamper effective communication and teamwork in the OR (11). Implementing specific interventions in health-care education and the workplace through interdisciplinary training is essential to overcome communication challenges. As individuals' surgeons and anesthesiologists may not promote these changes directly but they can use shared mental models concepts in their daily practice hence knowing and exploring those concepts is a crucial initial step.

Purpose This study aims to identify the prevalent dimensions of mental models for both anesthesiologists and surgeons in the OR. We strived to delineate the similarities and differences of their mental models in order to find specific areas of functional or dysfunctional relational patterns.

Hypothesis Our hypothesis is that the two specialties present similar individual dimensions of mental models that may help in creating shared values and enhanced communication or hinder such aims by their differences.

Methods
We employed a qualitative methodological approach by collecting data using semi-structured interviews from physicians in both specialties from six French Medical University Centers. Data was analyzed iteratively using thematic and content analysis and then constant comparative method. The number of participants included was determined by data saturation.

This study received ethics approval from French Speaking International society of ethics in medical education in May 2023. A request to CNIL (The National Commission for Computing and Freedoms was made (Reference Number2229367v0). The study was preregistered at ofi.io (Open Science Framework)https://doi.org/10.17605/OSF.IO/CVZQN

Participant selection was made using an informative email (Appendix 1) through announcements via department heads using doctors mailing list. Enrollment was on volunteer basis. The inclusion criteria were minimum 5 years of clinical experience and current practice in the French medical system. All subspecialties included. Face-to-face or videoconference interviews were taken in a hospital or university office. A total 17 participants responded to admission criteria and were included.

Data collection Semi-structured interviews were guided by a predetermined line of inquiry, as outlined in Appendix 2, while also allowing flexibility in questioning. This approach facilitated the exploration of emerging themes as the interview questions evolved throughout the data collection process. The formulation of the semi-structured interview questions was designed based on a comprehensive review of the existing literature on professional mental models, patient safety in teamwork, and interdisciplinary and interprofessional relationships. Additionally, we sought the input of a research assistant with specialized training in qualitative research to ensure clarity, smooth flow, and overall appropriateness of content.

Each interview lasted approximately 30 minutes and was recorded audibly and transcribed verbatim. Data collection continued until the point of saturation was reached, indicating that no new themes emerged from the data.
In qualitative research, sample size (8) is not typically predetermined, and the goal of qualitative analysis is not primarily focused on demonstrating generalizability to a larger population(12). Instead, the aim is to include a sufficient portion of the population of interest to adequately

describe a phenomenon within a specific context. In our study, a sample size of 9 participants from each specialty was considered acceptable and proved to be adequate for reaching data saturation (13).

Data analysis This study involved the utilization of inductive coding techniques (12,13) Following Creswell's coding process, we initially explored the data to obtain a general understanding before applying coding. For our study, these codes were further described and consolidated into themes. To ensure rigor and credibility throughout the data analysis process, triangulation was employed in several keyways. Firstly, the first author (C.A) performed coding using an inductive approach, assigning codes (labels) to relevant text segments corresponding to specific themes. Secondly, another researcher (J.S) also conducted coding. Involving two specialists in the data processing aimed to reduce bias and eliminate potential misinterpretations.

A codebook was generated(13), which listed all the identified themes along with their definitions and exemplar comments. This code table, as suggested in the literature, facilitated a systematic and structured representation of the data, enabling effective categorization of themes for subsequent writing.

Results

Demographics are detailed in Table1. The surgical subspecialties where: one neurosurgeon with an adult and pediatric practice, one plastic surgeon specialized in burn patients, two orthopedists and four general surgeons, all with a mixed pediatric and adult practice.

Table 1   Demographics

	Anesthesiologist	Surgeon
Gender		
Men	6	6
Women	3	2
Clinical experience		
Less than 10years	4	4
10 years and more	4	5
Age Category (years)		
30-45	2	5
45-60	5	1
60 and more	2	2

In accordance with our semi-structured interview, we delineate eight themes:

1. General impression of their relationship in the OR
2. Profesionnal Objectives
3. Definition of a "good" doctor
4. Relational factors involved in communication quality
5. Feeling understood or judged regarding OR medical decisions
6. The "ideal" way of their collaboration in the OR
7. Trust as relational background
8. Best patient outcome

The results regarding the seven themes descriptors are detailed in Table 2 in Supplementary Data.

Significant

General impression of their relationship in the OR*:*
Both specialties were highly aware of the importance of the quality of their communication in the OR. However, anesthesiologists generally described the environment as "familiar"," while the surgeons emphasized the term "friendly" and acknowledge that their relationship could become "vertical" when there are external stressors.

Professional Objectives
While few similarities were found on this specific mental model dimension main differences emerged. Anesthesiologists' objectives, generally, are focused on patient safety to minimize procedural complications and maintain vital function equilibrium.

> "My goal (in the OR) as an anesthesiologist is that the patient survives the anesthetic. In anesthesia, I'm not going to improve his state of health, that's the surgeon who can do that most of the time."

Surgeons, on the other hand, found technical efficiency as their main professional objective striving for diminishing operative time. Their also emphasized personal performance to avoid post-surgical complication.

> "By their very nature, surgeons operate and want to operate, so they tend to fill their operating schedule with more operations than they have time for."

Definition of a "good" doctor

For surgeons a "good" anesthesiologist ensures patient safety, efficiency, and comprehensive coverage of the surgical process. For an anesthesiologist a good surgeon makes right decisions, cares for patients comprehensively, collaborates with the anesthesiologist, and manages surgical complications.

Relational factors involved in communication quality.

Anesthesiologists value honest communication, standardized education and clinical experience, and respect for available resources. Surgeons prioritize speed, trust, and considering background noise interference(14).

> "In an operating theatre, unlike in other places, surgical leadership is linked to skill. The whole team recognizes the skillful surgeon, even if he's in a bad mood, even if he's sometimes unpleasant in his communication. The fact that he is a very good surgeon means that he will be recognized as a leader very easily, and vice versa. If he's not very good technically, his leadership will be a little difficult to establish."

Ideal Collaboration:

Surgeons: Present anesthesiologist, constructive exchanges. Anesthesiologists: discussing difficult cases, time, and silence when necessary. Both specialties: trust, familiarity, and experience-based collaboration.

> "Working with them on a regular basis. It's essential not to have to work with a new partner every day."

Trust:
For anesthesiologists, trust is built on years of experience and collaboration, honest and transparent communication. Surgeons - anticipation, and prevention.

Best outcome for the patient

> Both surgeons and anesthesiologists stress the importance of dialogue and collaboration. They seek others' perspectives, work in small teams, and engage in verbal exchanges to enhance teamwork.
> Honest communication and mutual respect for professional standards are essential.
> the need for ongoing education and training, including cross-specialty immersion and simulation-based exercises(8)   highlighted.
> Multidisciplinary meetings are necessary to seek different perspectives and foster a culture of risk-taking.
> Importance of training residents to understand the perspectives, roles, and responsibilities of each profession.

> Surgeons prioritize technical and professional performance, while anesthesiologists emphasize safety.
> "Risk assessment is not the same for them as it is for us. They have the technical risks, while we have the risks relating to the patient as a whole, essentially medical history."

> "They need to be trained to integrate our priorities because they don't understand them, they don't know the risks. I think training has a big impact."

Anesthesiologists believe that surgeons should avoid behaving in a superior way in the OR. Surgeons believe they have a long-time relationship with the patients.

> "Be acutely aware that we are in the same boat, working together. It's a partnership based on the expertise of each part and on dialogue." (surgeon)

Female surgeons were seen as more accessible through verbal communication and considered surgery more as a heeling gesture than a performance.

> "I see a difference between male and female surgical colleagues. The women are more into "I'm going to improve my patient's state of health", whereas the men have more of an alpha male side, a performance side."

The younger generation tends to be more demanding and interested in performance.

> "That he puts asleep quickly. He stays interested in the operation, enough to know in advance when it's going to be necessary, for example, to administer the antibiotic, and that he stays in the operating room most of the time."

Regardless of gender, age or specialty, everyone expressed the need to dialogue.

> "The discussions took place around a table, with several anesthetists and surgeons. It was quite exceptional. Everyday things, but they never talked together about all these details. I saw the magic."

The only two demographic factors reported were a standardized medical education and the same generations.

Analyzing the above mental model dimensions allow us to delineate three main relational stressors:

Time spent with the patient.
Conflicts on hierarchy fueled by personality differences and limited resources.
Performance over safety priorities

The spent with the patient: we found that surgeons have a long-term relationship with their patients, focusing on strategies for healing. Anesthesiologists have a rather punctual but "intense" relationship with their patients, prioritizing safety and comfort. Many participants spontaneously proposed individual solutions for bridging the gap between these perspectives. Some suggested common consultations, where both specialists work together on the case.

Conflicts on hierarchy fueled by personality differences and limited resources.
The OR, constrained by limited human, logistic, and technical resources, can become a stressful environment.(15) Maintaining respect and humility becomes more challenging in such situations. Many participants, including surgeons, suggested that despite the difficulties, surgeons should avoid displaying superiority in the operating room. This suggestion applies to all individuals involved in the OR.
The unanimous consensus was to focus on specific small teams that foster confidence through years of shared experience. Although participants acknowledged potential organizational challenges, they deemed this as the optimal solution for achieving the best patient outcomes.

Performance over safety priorities.
Encouraging teaching programs for young doctors and residents to experience the reality of the opposite team. Simulations are widely approved as an efficient tool. Guided immersion in the other specialist's daily routine is considered powerful. Changing this strong pattern is challenging for both.

Discussion

A successful relationship between specialties involves recognizing, understanding, and being aware of each other's mental models. Our study revealed that both surgeons and anesthesiologists recognize the importance of dialogue, trust, and expertise to best collaborate in the patient's interest. A constructive collaboration is based on sharing common dimensions of mental models(6).

Similar to Gardener, Aimee K et all (16) who showed that greater input of team shared mental models among the teams leads to better team performance, we pointed the importance of shared concepts and definitions, in giving the impression of substantial agreement on theoretical and practical practices. Our study is unique as it integrates Laura Edgar et al.'s findings (17), linking

shared mental models to effective communication and understanding of expectations among team members. We expand on this by analyzing the dynamics between two specialties in real-time exchanges, exploring eight major themes and revealing fresh insights into the interplay of shared mental models and successful communication in this context. Unanimously, participants acknowledged the importance of understanding and bridging differences, fostering trust, effective communication, and mutual respect(17) to optimize collaboration and patient outcomes in the OR.

While communication's importance is consensually acknowledged at all levels, our study reveals significant value differences among our participants. These divergences encompass varying emphasis on performance, risk acknowledgment, safety limits, resident training approach, and perception of hierarchy in the operating room. It's crucial to note that these differences can positively contribute to dynamics, creativity, and patient outcomes when made explicit. However, they can also lead to discordance.

By examining the aforementioned mental model dimensions, we can identify three primary relational stressors: time spent with the patient, conflicts related to hierarchy driven by personality differences and limited resources(18), and the tension between prioritizing performance over safety(19).

Over the past decade, there has been a perceived improvement in relationships among participants.(20) Some attribute this to increased emphasis on interdisciplinary communication.(21)(22) The use of simulation learning might also play a role.((23) (24) .

Verbal communication improvement could be linked to the rising presence of women in the operating room(25). Women are believed to be more open to verbal communication,(26) and the increasing number of female surgeons(27) and anesthesiologists supports this hypothesis. Further research is needed to substantiate this claim.

Unlike others reports,(28) in our study, none of the participants associated communication difficulties with or caused by gender. Two demographic factors cited were standardized medical education and belonging to the same generation, which implies similar functioning styles.

Despite the created "same boat ride" image, there was a sense of frustration during the interview, possibly due to focusing on theoretical rather than field analysis. The individual perception (29)of each other in real-life versus conceptualization might explain this.

Limitations of the present study are to be considered. One may be that the surgeons population is heterogenous as halve of the participants have a full or partial pediatric subspecialty, which might influence their mental model characteristics, slightly differing from strictly adult surgeons. Another limitation is a potential selection bias in participant recruitment. Participants with particularly positive or negative experiences with the other specialty or a specific interest in communication may have been more likely to volunteer.

The originality of our study allowed us to obtain comparable perspectives on different medical specialties. Each participant offered valuable insights into the multidimensional aspects of bilateral communication. The qualitative analysis allowed for a rich exploration of stakeholders' observations, experiences, and suggestions for improvement. Our findings reveal important targets for future interventions.

The emergent solutions generated by reflexive thematic analysis could be a further research reflection that needs to be addressed.

Conclusion

A successful relationship between specialties involves recognizing, understanding, and being aware of each other's mental models. Based on professionalism, transparency, trust, and confidence, a slow and steady process can lead to significant improvement in collaboration. Shared dimensions of OR professionals' specific mental models clearly catalyze a positive relational dynamic. Awareness of contrasting domains as hierarchy issues and different priorities is important as it may allow fine, targeted relational tuning.

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Table 2 Main identified mental models and their themes.

Themes	Anesthesiologists	Surgeons
Global image of relationship	"familiar" Positive, exchange, collaboration, equality, professional, and relaxed relationship.	"friendly" Excellent and very good, easy. Vertical if it lacks trust, while acknowledging that it is person dependent. It can become complicated or complex due to institutional or organizational issues in the operating room. collaboration, equality, professional
Expectations from each other	Be efficient, sincere, open-minded, make the right surgical indications and decisions, Have good technical skills, communicate, and collaborate, respect scheduled time, and be respectful with the team	Ensure efficiency in putting patients to sleep quickly and well, anticipate and communicate difficulties, Be present and involved in the operating room, offer a sense of security, cover pain management, and share the main goal.
Good surgeon	Has a minimal post-operative complication, operates well. Listens, demonstrates surgical leadership, makes quick decisions, communicates, shares tasks, has a good knowledge of the patient and technical skills.	Makes the best diagnoses and decisions. Cares for patients throughout the surgical process, communicates and exchange with the anesthesiologist, manage surgical complications
Good anesthesiologist	Is capable to remain calm and not be overly stressed, regularly faces challenges and learns from experiences. Has good knowledge and self-control in critical situations, Good interpersonal skills	Provides security for the patient. Is efficient, anticipates and prevent complications. Covers the entire surgical process, Is interested in the surgical procedure and communicates effectively.
Factors that Determine the Relationship	Frequency and history of working together is considered fundamental. Verbal exchange is easier with women surgeons. Honesty and sincerity in communication are crucial. Importance of speaking a correct language independently from accent. Same educational school or learning program. Clinical experience. Caring nature and empathy of people. Environmental factors.	Trust and mutual respect are prioritized. Fluent and transparent exchange. Factors are related to individuals and situations. The frustration and global OR's atmosphere. Respect for others. No incrimination of demographic factors reported. Interest in surgical technique. Technical and professional efficiency. Background noise as a potential barrier. Sincerity and safety in working together. Long-time experience of working together.
Personal Objectives	Essential focus on safety and absence of side effects or complications. Optimal management of postoperative pain. Ensure physical and mental integrity.	Limit morbidity and perform the most complete and perfect gesture. Ensure right surgical indication and diagnosis. Solve problems comprehensively.

	Provide comfort, qualitative gestures, and results. Contribute to a good overall experience. Survive the anesthesia process.	Take care of the patient from start to finish offering a positive patient experience. Explain the correct diagnosis. Perform the surgical technique according to scientific recommendations. Respect the terms of the contract. Help patients understand and accept their illness. Have a happy patient alive with no complications. Provide solutions, improvements, and maximum results.
Perception of the other's Objectives	A surgeon wants to save time. The speed. No complications. Well-being. The performance. To Offer the best possible care for the patient and Safety. To improve the state of health of their patient. Women were more = I improve the state of health of my patients, man's have more the performance side.	Provide perfect sedation. Anticipate and efficiently manage complications. Pain management, nutrition, and patient comfort. Offer a positive global experience in the operating room. Evaluate long-term pain control. Offer emotional, functional, and psychological benefits.
The Feeling of Being Understood or Judged:	Anesthesiologists view patients holistically, while surgeons focus on specific indications. Surgeons consider anesthesiologists work as futile and easy. The understanding of risks for the patient and culture of risk varies among surgeons. Trust and understanding are built through respect, experience, and recognition of safety importance.	Perception that surgeons are more involved than anesthesiologists due to their commitment and responsibility for patient outcomes. Surgeon's value the anesthesiologist's recognition and follow-up on patients in the long term. Insufficient consideration, refusal of their decisions, and challenges to their sovereignty may lead to conflicts. Limited time together impedes full understanding.
Ideal Relationship and Building Trust	Discussion of difficult cases, indications, techniques, and surgical times. Agreement and communication before surgery. Exchange during complications. Time and silence for each other. Conflict minimization through verbal exchange. Surgeon's presence when patients arrive. Meetings and discussions to express viewpoints and build trust. Knowing each other's capacities and reacting to conflicts.	Maximum cooperation, respect, and non-verbal/verbal communication. Present anesthesiologist in the room throughout procedures. Time to discuss between patients. Partnership based on experience and working together. Building the relationship through discussions before the operating room. Less Noise

Trust is Based on	Time, experience, and collaboration. Proportion of familiarity and friendship. Demonstrating and proving competence. Honest and transparent communication about difficulties. Critic shared situations that make relationships closer. Verbalizing difficulties, action plans, and emotions.	Diminishing voice-tone during critical situations. Time to know each other. Transparency and avoiding hidden information. Understanding each other's reaction capabilities. Dealing with conflicts from a distance. Anticipation, discussion, and prevention.
Achieving Best outcome for patients	Safety, absence of complications, and optimal management of postoperative pain Importance of training surgical residents to understand the perspectives, roles, and responsibilities of each profession. Simulation-based training and early collaboration between anesthesiology and surgery residents Surgeons are encouraged not to have an ego expression or consider themselves superior in the operating room. They are reminded to accept that both surgeons and anesthesiologists are on the same boat, working towards the well-being of the patient. Dialogue and Collaboration Working in small teams and engaging in verbal exchange to enhance teamwork. Continuous Learning and Improvement- the need for ongoing education and training, including cross-specialty immersion and simulation-based exercises, to enhance understanding, awareness, and constructive collaboration.	Importance of keeping performance as a goal for achieving better patient outcomes Fixing goals through multidisciplinary meetings and regularly reviewing difficult cases and incidents together. The surgeon is the one who cures, but he cannot do so with no help. Anesthesiologist should pay attention to the patient will to be operate, and to help make it possible. Dialogue and Collaboration •working in small teams and engaging in verbal exchange to enhance teamwork. Trust and Professionalism -open and honest communication, mutual respect, and adhering to professional standards. Simulation based training. Trust and Professionalism -open and honest communication, mutual respect, and adhering to professional standards. Multidisciplinary Approach

Appendix 1 Informative E-mail (translation)

Hello,

Thank you very much for agreeing to take part in my research project entitled:
The characteristics of professional mental models among anaesthetists and surgeons in the operating theatre?

The aim of this study is to explore the relationship between anaesthetists and surgeons, through your personal experience.

To do this, I would like to propose a 30-minute talk exploring the mental models of each.

In order to make it easier for everyone to manage their time in this hectic and busy world, I suggest that this exchange take place by videoconference or face-to-face, at your convenience.

I thank you in advance for your interest in my work and remain at your disposal for any further information,

Yours faithfully
Christina Aron

Bonjour,

Merci beaucoup d'avoir accepté de participer a mon travail de recherche intitulé : **Quelles sont les caractéristiques des modèles mentaux professionnels chez les anesthésistes et chirurgiens au bloc opératoire** ?

Le but de cette étude est d'explorer les relations entre anesthésistes et chirurgiens, à travers votre expérience personnelle.

Pour cela je vous proposerais un interviw qui explore les models mentaux de chacun d'une duree de 30 min environ.

Afin de faciliter la gestion de temps de tous dans ce monde si pressee et occupé je vous propose que cet echange se passe par visio conference ou bien en presentiel, a votre convenance.

Je vous remercie d'avance pour l'intérêt que vous porterez à mon travail et je reste à votre disposition pour toute information complémentaire,

Cordialement,
Christina Aron

Appendix 2 *Semi-structured interview guide for exploring The characteristics of professional mental models of anesthesiologists and surgeons in the operating room.*

The overall aim of the interview is to help us understand your experience of working in the operating theatre and also to explore how interaction with your operating theatre partners is influenced by how each of you operate.
The interviews will be recorded, transcribed, and anonymized. These transcripts will be analysed qualitatively to help us understand the behaviours associated with intraoperative bilateral working.
We will ask you several questions during this discussion. There are no right or wrong answers, so please take your time to explore.

I'd like to start with some basic demographic questions:

1. What is your professional role? If surgeon - what is your surgical department?
2. How many years post-internship have you been practising (surgery/anaesthesia)?
3. In which age bracket would you place yourself: 30-45 years 45-60 or 60 and over
4. How would you describe your gender identity?

Thank you.

Are you ready to start our interview?

1. How would you describe your day-to-day working relationship with the other healthcare professionals in the operating theatre?
Interviewer: The nurses?
Interviewer: What about the surgeons/anaesthetists?

2. What do you expect from the surgeons/anaesthetists in the operating theatre?
Interviewer: What do you think makes a good surgeon/anaesthetist?

3. How do you recognise "good" surgeon? and a good anaesthetist?
Interviewer: for soft skills (communication, leadership, situational awareness, decision making), procedural skills, emotional skills?

4. You mentioned earlier that your relationship with most surgeons/anaesthetists is positive/negative/mixed in general, what factors do you think contribute to this?
Interviewer: Gender/ethnicity/age/language/accent/other?

5. What is your main professional objective regarding your patient?

6. What do you think are the main objectives of the surgeons/anesthetists you usually work with?

7. How do you understand the roles and responsibilities of an anesthesiologist/surgeon in patient care?

8. Do you think anesthesiologist /surgeons (unlike the interviewee) understand your roles and responsibilities in patient care? Why /why not?

9. What would an ideal collaboration between a surgeon and an anesthesiologist look like? How often does this actually happens in the operating room?

10. How do you establish a relationship of trust with your colleagues during surgery?

11. What makes working with a surgeon/ anesthesiologist a success?
Interviewer: for example, procedural expertise, risk assessment, adaptation to changing circumstances, communication, etc.

12. In your opinion, how can anesthesiologists and surgeons optimize their collaboration to improve patient outcomes?

13. Is there anything else you would like to add that we didn't cover in this interview?