Teamwork, communication, and anaesthetic assistance in Scotland

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Summary. Teamwork involves supporting others, solving conflicts, exchanging information, and co-ordinating activities. This article describes the results of interviews with anaesthetic assistants (n=22) and consultant anaesthetists (n=11), investigating the non-technical skills involved in the effective teamwork of the anaesthetic assistants in the operating theatre. Anaesthetic assistants most commonly saw themselves as either being part of a theatre team or an anaesthetic subgroup and most commonly described the senior theatre nurse as their team leader. Examples of supporting others included the following: checking equipment, providing equipment, being a second pair of eyes, providing emotional and decision support, and supporting trainee anaesthetists. Of the 19 anaesthetic assistants who were asked if they would speak up if they disagreed with a decision in theatre, only 14 said that they would voice their concerns, and the most common approach was to ask for the logic behind the decision. The WHO checklist was described as prompting some anaesthetists to describe their anaesthetic plan to the anaesthetic assistant, when previously the anaesthetist would have failed to communicate their intentions in time for equipment to be prepared. The prioritization of activities to achieve co-ordination and the anaesthetic assistants becoming familiar with the idiosyncrasies of their regular anaesthetists were also described by anaesthetic assistants.

Keywords: anaesthesia; communication; helping behaviour; operating room nursing; operating room technician

Effective teamwork is crucial to the success of work in the operating theatre.1 2 This article describes an interview study into the teamwork of anaesthetic assistants in the operating theatre. In the UK, anaesthetists are assisted by both anaesthetic nurses and operating department practitioners (ODPs). In this article, anaesthetic nurses and ODPs will be collectively described as anaesthetic assistants.

While it is usually obvious to all when teamwork breaks down, defining teamwork is more difficult. Salas and colleagues3 defined teamwork as ‘a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission, who have each been assigned specific roles or functions to perform, and who have a limited life-span of membership’.

This article has been structured around the elements of teamwork, which in addition to doing one’s own tasks, includes supporting others, solving conflicts, exchanging information, and co-ordinating activities.6 The adverse outcomes of the failure to form a cohesive team in the operating theatre have been recorded for over a hundred years. The Lancet commission on the safety of the administration of chloroform in 1893 criticized the practice of a single surgeon operating (and anaesthetizing) without another medical practitioner present to provide assistance in the event of difficulties.5 After the inception of the NHS in the UK, anaesthesia became a consultant-led service, but issues of the failure of teamwork persisted. Lunn and Mushin6 in 1982 reviewed deaths associated with anaesthesia and concluded that a factor contributing to some of the deaths was a lack of support for trainee anaesthetists.

The role of anaesthetic assistants in critical incidents was investigated by Kluger and colleagues7 in the Australian Incident Monitoring System (AIMS) database. They found reports of instances when the anaesthetic assistant ameliorated the incident and also cases when it had been exacerbated by the anaesthetic assistant. Lingard and colleagues1 examined communication in the operating theatre and showed that 31% of communications had flaws and 34% of these had an adverse impact such as delay or extra workload. Catchpole observed failures of non-technical skills during laparoscopic cholecystectomies and carotid endarterectomies, which were associated with an increased risk of critical incidents.2

In 1988, the Association of Anaesthetists of Great Britain and Ireland published a guideline ‘Assistance for the...
Anaesthetist', which stated ‘to ensure that patients have a safe and efficient anaesthetic service and that therefore every anaesthetist has adequate assistance at all times and that the person providing the assistance is adequately skilled.’8

Non-technical skills are the cognitive, social, and personal skills, which complement technical skills, and contribute to safe and efficient task performance.9 After lessons learned from other high-risk work settings, researchers have become interested in studying behaviour, to improve safety, in the operating theatre. Non-technical skill taxonomies have been developed for anaesthetists (ANTS),10 surgeons (NOTSS),11 and scrub practitioners (SPLINTS).12 Teglgaard and Østergaard are developing a non-technical skills taxonomy for nurse anaesthetists in Denmark (H. Teglgaard, personal communication, 2012). Research tools have also been developed to assess teamwork in the operating theatre and include Revised NOTECHS,13 Oxford NOTECHS,14 and OTAS.15 16 A review of the literature found scant research had been conducted on non-technical skills used by anaesthetic assistants in the operating theatre.17

Methods

An interview study was performed in order to identify the critical non-technical skills for safe and effective anaesthetic assistant performance. Ethical approval was granted by both the West of Scotland NHS Research Ethics Committee (Ref: 11/AL/0089) and the Aberdeen University Psychology Research Ethics Committee (Ref: 2103111531). A semi-structured interview schedule, similar to the one used by Mitchell and colleagues,12 was designed to elicit behaviours and skills, which anaesthetic assistants believed were critical to acquire, in order to perform the role effectively. The anaesthetic assistants’ interview initially focused on their routine day-to-day work, and then on a non-routine case. The consultant anaesthetists were asked about which behaviours of the anaesthetic assistant assisted or hindered them, and how this changed when working with assistants who were inexperienced or new to the anaesthetist. We interviewed anaesthetic assistants with at least 1 yr experience with a range of 2–30 yr, and consultant anaesthetists (n=11) had a median of 15 yr experience with a range of 6–22 yr. All were from NHS district general or teaching hospitals in Scotland. The anaesthetic assistants comprised ODPs (n=6), anaesthetic nurses (=14), and anaesthetic nurses who had also completed ODP training (n=2). Inter-rater reliability for the interviews with anaesthetic assistants and consultant anaesthetists was acceptable; k=0.7 and k=0.61, respectively.18

We will describe their views on team structure, before proceeding to look at the behaviours of teamwork.

Team structure

The anaesthetic assistants were asked which team they felt they were a part of? The first response is shown in Figure 1. While most saw themselves inclusively as part of the whole theatre team, or in an anaesthetic subteam within the theatre team, a significant minority felt that they were primarily part of the nursing team.

Conversely, all the consultant anaesthetists saw themselves as the leader of the team:

I think that the anaesthetist is always the leader of the anaesthetic group. (Anaesthetic consultant AC)

This was not generally the view of the anaesthetic assistants (n=20) (Fig. 2).

Box 1: Example of coding from the transcripts

‘So I would tend to go back just before I leave the theatre and usually just have a quick check that everything is alright at the top end#. There is a surgical pause done. This is performed sometimes by ourselves again, or by a surgeon. We would all introduce ourselves##, who will also do that as well as in the anaesthetic room and just go through the checklist, got the correct patient consent form, that we are doing the correct operation (TM, planning & preparation) ### if there is additional equipment required, allergies, stuff like that’.  

Some of the coding categories, shown by # above:  

# Cognitive skills; e.g. situation awareness, and decision-making.

## Social/interpersonal skills; e.g. communication, teamwork, and leadership.

### Task management skills; e.g. planning and preparation, prioritizing, maintaining standards, identifying and utilizing resources.

#### Stress/fatigue management skills.

##### Others, uncategorized.
Supporting others

Supporting others in the team was illustrated by reference to behaviours, which were described as follows: equipment checking, equipment provision, being a ‘second pair of eyes’ for the anaesthetist, and providing emotional and decision support.

Checking equipment and the anaesthetic machine was widely described:

First off. … I don’t do anything else but sit in front of the anaesthetic machine until it is checked. (Anaesthetic assistant AA)

It could also give warning of poor team performance to a consultant anaesthetist:

If I turn up and they don’t have that [checks] side of things I wonder what else have they not got a grasp of? (AC)

The consultant anaesthetists reported being grateful for the provision of equipment:

one of the things we really rely on them for is getting stuff. (AC)

It was obvious that the anaesthetic assistants made considerable efforts to have the correct equipment ready at the right time:

The anaesthetist can turn around and at a glance say that she has got that, that and that so we are ready to go! (AA)

While the anaesthetist may be focused on tasks the anaesthetic assistant can provide a second pair of eyes to prevent problems:

they are bagging the patient … and you think, he will notice, he is bound to notice. [To the anaesthetist] ‘Can you turn the sevoflurane on?’ (AA)

and often with great tact:

I said to the doctor, are you sure that is the right leg you are blocking there? The patient was awake. … I tried to do it very discretely, and he did say you are right, it is the wrong leg. (AA)

While the anaesthetic assistance is appreciated in routine cases, it can make a huge difference in critical events. An anaesthetic assistant described the support given during a ‘can’t intubate, can’t ventilate’ situation, when the anaesthetist was severely stressed:

panic set in, he was shaking … and said ‘What will I do? What will I do?’ and things like that. … Just calm, down, please calm down, we can do this together, stay calm, breathe! (AA)

In addition, suggestions were made about trying different laryngoscope blades, a bougie, or a laryngeal mask:

Make a suggestion, try something different every time you try. … (AA)

and when the anaesthetist is fixated on trying to intubate the patient who is hypoxic:

let’s just … wake him up? (AA)

Both the consultant anaesthetists and anaesthetic assistants remarked on the role that anaesthetic assistants play in supervising trainee anaesthetists, especially out of hours:

There are times they [trainee anaesthetists] are a doctor and when you will be led by them, and there are times when they have to bow to your experience … we will get something and wave it under their nose to use, you know if they are having trouble intubating … and they can say ‘can I have the bougie, please?’ It is subtly done. (AA)

Anaesthetists vary in their practice from each other, and the anaesthetic assistant has to cope with the variations:

Wee [Scottish for small or particular] ways. Each and every anaesthetist has their own wee ways! (AA)

Sometimes, the differences in preference for minor things can be a source of friction. A consultant anaesthetist asked for the music to be turned down during a stressful period in the operating theatre and remarked that she did not even like the music of the band, U2. Over the course of the rest of the list, she heard comments around the operating theatre:

Can you believe it, she doesn’t like U2? (AC)
There were also reports of the anaesthetic assistants having to maintain professional behaviour, despite the rudeness of some consultant anaesthetists:

- starting off in the morning shouting at people, swearing at people. It doesn’t happen very often… you just have to carry on. (AA)

and also:

- I don’t want to work with them crabby [ill-tempered] people, but then you have got to because you are there for the patient…. (AA)

One consultant described the support when things were going badly in theatre:

they give us huge support, even when actually we are grumpy, even when we are… when we are having a bad day… they will be steady. (AC)

**Solving conflicts**

The anaesthetic assistants were asked what they would do if they disagreed with a clinical decision in theatre. The majority of the anaesthetic assistants said that they would speak up, but 26% (n=5) indicated that they would not. Just because someone says that they will speak up does not always mean that they will in practice. One experienced anaesthetic assistant in a critical incident explained:

… [it] was lucky that I felt comfortable approaching the anaesthetist because I knew who he was. … (AA)

Among those who said that they would speak out, the most common approach described was to enquire what was the reasoning behind the decision:

I would speak to the anaesthetist. … I would just see what the reasoning was behind the decision. (AA)

Alternatively, an intermediary might be sought, whether the senior nurse for the theatre, or a trainee anaesthetist:

- It’s normal to pick on the poor [anaesthetic] registrar… say to them, and they can [sort it out] … (AA)

Graded assertiveness is taught in aviation to help provide a structure of how to speak out, with escalating levels of urgency as in Observation, Suggestion, Challenge, and Emergency; and examples of these four levels are described in Table 1.

**Exchanging information**

The introduction of the WHO surgical checklist was felt to have improved the communication with the anaesthetic assistants by some consultant anaesthetists, who had previously failed to share their anaesthetic plan:

- [the anaesthetist will] let you know beforehand if the patient is going to be difficult. So you have the right equipment available. … This is an instance where the new WHO forms have been quite useful…. (AA)

While it is good to communicate, it helps to have an awareness of the context. One consultant anaesthetist talked about doing a difficult central venous catheter insertion under ultrasound guidance, and not wanting to be distracted at a critical stage if the SpO2 has only gone down from 98% to 97%:

at the same time they will be sufficiently sensitive to what I am doing that they won’t give me unnecessary information. (AC)

The challenges of exchanging information were also described between the anaesthetic assistants at handovers:

- the nurses will turn and say… ‘just go for your break’! … and I will give them a run-down of everything we have done for him. (AA)

It was not clear whether this was due to some anaesthetic assistants feeling that as the patient was stable, there was no need to gather information; that they would be handing responsibility for the case back to the previous anaesthetic assistant; or that they did not need to hear these things to do their job effectively.

Closed-loop communication involves the transmission of a message, the receiver reporting the message back so that the sender knows that it has been transmitted correctly as was described so both sender and receiver are in no doubt about the message:

- you know that they have clearly heard what you said and have let you know that they heard. … (AC)

**Co-ordinating activities**

The work in the operating theatre is complex, and it is helpful if both the anaesthetist and anaesthetic assistant share the same vision of what needs to be achieved, and also the appropriate timing:

- They have seen the bigger picture, what is important now, what is important in ten minutes time. … That sort of thinking ahead. (AC)

A consultant anaesthetist described an anaesthetic assistant, who disappeared at an inappropriate moment to collect equipment:

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**Table 1 Examples of graded assertiveness**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>That pulse is drifting down a bit… (AC)</td>
</tr>
<tr>
<td>Suggestion</td>
<td>To a trainee anaesthetist during a difficult intubation:</td>
</tr>
<tr>
<td></td>
<td>I can get some help, I have just spoken to a consultant anaesthetist along the corridor… (AA)</td>
</tr>
<tr>
<td>Challenge</td>
<td>Spoken to two junior trainee anaesthetists at 10 p.m.:</td>
</tr>
<tr>
<td></td>
<td>I asked them if the consultant anaesthetist was aware they were going ahead with a four year old? (AA)</td>
</tr>
<tr>
<td>Emergency</td>
<td>Said to a trainee anaesthetist:</td>
</tr>
<tr>
<td></td>
<td>I am just going to call her consultant anaesthetist in because you need some help! (AA)</td>
</tr>
</tbody>
</table>

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You do want it, but you don’t want it then. (AC)

The team needs to share the same mental model to cope with unexpected events without resorting to micro-management. Good situation awareness of both what is happening and the stage of the operation assists with co-ordinating the activities in theatre:

Once the patient is on the table and the knife to skin make sure the anaesthetist is happy, is there anything else he needs? . . . you can start, . . . cleaning your decks, cleaning up, . . . and preparing your airway trolley for the next one for all the stuff you need. (AA)

Failure of a team vision or situation awareness was described as a source of annoyance:

What really irritates me is that you turn around and they [the anaesthetic assistants] have gone and you have no idea where [to] or when [they will return] . . . (AC)

The anaesthetic assistants described learning to ‘read’ their anaesthetist:

are they [the anaesthetist] sitting back relaxed, are they standing up, are they checking the airway . . . (AA) or

seeing the anaesthetist changing the [anaesthetic gas] flow rates, starting to check the muscle relaxant. (AA)

This lack of familiarity made life more difficult when working with locum anaesthetic assistants:

they don’t know how you work . . . (AC)

Discussion

This interview study revealed examples of the elements of teamwork between the anaesthetic assistant and the consultant anaesthetist in the operating theatre.

The data presented indicated that elements of teamwork such as supporting others, exchanging information, solving conflicts, and co-ordinating activities were important skills for the anaesthetic assistant to develop. The phrases that were identified for coding often had several elements within them:

You do want it, but don’t want it then. (AC)

This phrase has, for example, both the elements of teamwork and situation awareness, and the coding was allocated to whichever element appeared to be dominant in the context. Non-technical skills have been identified for a range of occupations in high-risk settings, so it was unlikely that a new non-technical skill, not previously documented, would have emerged; however, we included a code of ‘other’ to label material which did not fit existing descriptions.

This was an interview study, and relied on the personal accounts of anaesthetic assistants and consultant anaesthetists. By interviewing subject matter experts with a wide duration of experience (2–30 yr), it is hoped that these data are reflective of anaesthetic assistant practice. People do not always report what they do, and this study was limited by the lack of direct observation. However, the information from the consultant anaesthetists matched that provided by the anaesthetic assistants, and rang true in the experience of the lead author with 25 yr as an anaesthetist.

Reason described latent and active failures coming together to defeat our defences in a critical incident. Normally good teamwork is one of the barriers to the development of a critical incident, and the interviews revealed a number of examples where the anaesthetic assistant prevented or ameliorated critical incidents, as described by Kluger and colleagues. We did not, however, have any incidents reported where the anaesthetic assistants had contributed to an adverse event. One consultant we interviewed took the view that he was ultimately responsible for the anaesthetic, and if a problem ensued, the anaesthetic assistant was not responsible, as a consultant anaesthetist he had failed to communicate adequately what he needed. We asked the anaesthetic assistants to recall a critical case, where their skills had made a difference to the outcome whether positive or negative. We are more likely to be happy to share tales of where we have done something well, and this may partly explain the response we obtained. The consultant anaesthetists, when asked if they could remember a case where poor assistance had contributed to a problem, were unable to recall a case.

The anaesthetist is frequently task saturated during the practical procedures required for the performance of an anaesthetic, and the anaesthetic assistant provides a second pair of eyes to recognize and report problems. While most anaesthetists are happy for their anaesthetic assistant to identify observations they have missed, some anaesthetists do not want to be challenged.

The ability to speak up if you disagree with something being done is crucial to providing a useful second pair of eyes. It was interesting to find that five of the anaesthetic assistants interviewed said that they would not, or might not speak up. This raises the issue of why some would speak up, and whether the staff who said that they would speak up would do so in practice. We wondered if less experienced staff would lack the confidence to speak up, and therefore it would be the more experienced staff, who would be assertive. However, the staff who said that they might not speak up ranged in experience from 8 to 22 yr, so this cannot be the explanation.

Traditionally, operating theatres have been very hierarchical, and this would lead us to anticipate that the older anaesthetic assistants would defer to the doctor, but this also was not supported by the evidence. Voicing one’s concerns can be difficult to do, and just because the anaesthetic assistants have said that they will speak up does not imply that this will consistently happen in practice, so this may be an example of self-reporting bias. Anaesthetists surveyed in Scotland expressed similar discomfort with 53% saying that they would feel uncomfortable telling other disciplines what to do in the operating theatre. Pointing out an error may be interpreted as criticism by the recipient, when the intention had been to maintain patient safety. This creates an uncomfortable balance for the anaesthetic assistant to
assess whether the risk of harm is sufficient to voice their concerns.

Rudeness by anaesthetists was mentioned by two of the 22 anaesthetic assistants, but it was not one of the questions in the semi-structured interview, so it may have been more commonly experienced. For instance, Coe and Gould reported that 66% of NHS theatre staff described being on the receiving end of aggressive behaviour from other nurses, and 53% from surgeons in the previous 6 months. Instead, rudeness was described as an unusual behaviour by the two anaesthetic assistants who mentioned it. One of the consultants described the pressure experienced while things were not going well during an anaesthetic, and said he/she could be curt in the heat of the moment, but would apologize afterwards. One can take the view that staff should remain polite even under difficult circumstances, but the argument can also be made that during a critical incident, staff should focus their skills on resolving the problem (and hence not using their limited mental resources to be polite), and then repair their relationships afterwards, relying on their colleagues’ ability to recognize that they were stressed and task-focused at the time of the event. The consultant anaesthetists appreciated the ability of anaesthetic assistants to maintain their equanimity, despite the pressures of the job.

Effective teamwork is aided by staff having a shared mental model of both what is happening and what are the goals. The anaesthetic assistants repeatedly commented upon the importance of not leaving theatre at times of increased risk, of being aware of what was going on, and anticipating what was going to happen so they could be prepared.

In conclusion, this study has shown that anaesthetic assistants in the operating theatre use the teamwork skills of supporting others, solving conflicts, exchanging information, and co-ordinating activities. These identified behaviours will contribute towards the development of a new taxonomy of non-technical skills for anaesthetic assistants in the operating theatre.

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