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Learning From Others: A Case Report from the Anesthesia Incident Reporting System

Case 2021-07: Steep Hierarchy, Steep Lessons

An 8-day-old baby underwent resection of a large neck mass. After surgery, the patient was transferred to the NICU but the operative site was "oozy" with ongoing drain output totaling 150ml over the first hour. Blood products were given, and after a further hour the patient was transferred back to the operating room. Sadly, hypovolemic cardiac arrest occurred and, after three hours of failed resuscitative efforts, the baby died.

The circulating blood volume of a term newborn baby is approximately 300ml. In this tragic case, the startlingly brisk pace of drain output was a red flag for the need to recognize, communicate, and swiftly respond to life-threatening postoperative bleeding. Human factors, once considered a "soft skill" in anesthesia, but now recognized to contribute to the majority of sentinel events, are an essential part of this process (*Br J Anaesth* 2013;110:463-71). The OR is a team environment where the anesthesia team may be the first to recognize a critical deterioration. However, our ability to coordinate a response may be hampered by an imbalance in psychosocial dynamics, cognitive overload, or institutional hierarchy.

Non-technical skills (NTS) in medicine can be defined as "the cognitive, social, and personal resource skills that complement technical skills, and contribute to safe and efficient task performance" (*Br J Anaesth* 2010;105:38-44). Many of these skills are not consciously acquired, and health care providers may therefore be unaware of gaps in their competence. In other high-risk industries such as aviation and nuclear power, demonstration of strong NTS is essential for licensing and revalidation (*Br J Anaesth* 2010;105:38-44). As all safety-conscious health care practitioners know, awareness and mastery of the human factors at play are as important in the prevention of negative patient outcomes as technical skill and clinical knowledge. We should then place equal emphasis on training and development of NTS throughout a practitioner's career.

One framework for qualifying NTS and assessing individual competency is the Anaesthetists' Non-Technical Skills (ANTS) System (*Br J Anaesth* 2003;90:580-8). This system breaks down the requirements into four categories, each with three to five elements (Table 1). All sections can be applied to this case. The anesthesiologist must plan and prioritize tasks, work with the team to stabilize the child, recognize situational changes such as the brisk blood loss seen here, and make balanced decisions about a controlled return to the OR. Other measures can also be used to supplement the assessment of interpersonal communication skills, such as patient experience surveys and anonymous 360-degree feedback exercises.

Table 1: Categories and Elements of the Anesthetists' Non-Technical Skills System (ANTS) for Assessing Individual Competency

Category	Element
Task Management	Planning and preparing
	Prioritizing
	Providing and maintaining standards
	Identifying and utilizing resources
Team Working	Coordinating activities with team members
	Exchanging information
	Using authority and assertiveness
	Assessing capabilities
	Supporting others
Situation Awareness	Gathering information
	Recognizing and understanding
	Anticipating
Decision Making	Identifying options
	Balancing risks and selecting options
	Reevaluating

Br J Anaesth 2003;90:580-8.

With such a brisk blood loss in this case, it would appear that there was an excessive delay in re-exploration of the surgical site. Reasons for the delay in returning to the OR could include task fixation, unwillingness to speak out in a steep hierarchical situation, or the quality of the handoff to the NICU. It is highly likely that at least one member of the team was aware of the critical nature of the situation but was unable to influence the team to act in time to save the child's life. From early psychological experiments where normal subjects were told to give shocks of increasingly lethal voltage to an innocent person, it has been shown that people find it difficult to challenge the instructions of an authority figure. A longstanding approach to expertise in medicine is that of *mystery-mastery* (*J Abnorm Psychol* 1963;67:371-8).

Mystery-mastery is characterized by a steep hierarchy where the person of authority assumes an all-knowledgeable position, keeping their reasoning hidden and perhaps even treating questions as insubordination. Unsurprisingly, this approach is associated with poor strategy development and a lack of organizational learning. A steep hierarchy with mystery-mastery can also be associated with other problems, such as bullying, fear, and intimidation. In this type of environment, there are many factors that make it difficult for team members to challenge a decision, even when serious patient harm may result. These include fear of retribution, jeopardizing the future working relationship, concern for reputation, fear of embarrassment, and avoidance of conflict. For trainees, there are additional deterrents, including the risk of negative evaluations, disruption of the teacher/student relationship, and the perception of a hidden curriculum relating to professionalism (*Simul Healthc* 2009;4:84-91).

Although much work has been carried out with junior staff to train them in *speaking up*, the responsibility to change the gradient of the hierarchy and clear the way for speaking up lies squarely with senior decision-makers. This does not involve assuming a completely flat hierarchy. Senior leaders who rely on the rest of the team to make decisions and are constantly unsure are equally ineffective. An effective alternative to mystery-mastery is that of *collaborative inquiry* or *public thinking*, where the senior decision-maker shares their planning and reasoning then invites others to give their thoughts, receiving team contributions with genuine curiosity. This leads to a flattened hierarchy and the breaking down of barriers that prevent staff from speaking up. New information may surface, and the dialog takes a self-correcting approach to the best and safest plan for the patient (*Br J Oral Maxillofac Surg* 2017;55:449-53).

In our case, collaborative inquiry could have started with the preoperative planning process. The planning of unusual or complex surgeries frequently now includes an environmental simulation session using a 3D printed model of the patient's anatomy (*Anesthesiology* 2014;120:110). These simulations should include all of the personnel who will participate in the actual surgery and can also facilitate discussions of worst-case scenarios. If life-threatening bleeding was recognized via collaborative inquiry as a possibility, perhaps ECMO may have been considered for the case or made available as a back-up.

Another opportunity for collaborative inquiry in this case might have been the preoperative huddle. The evidence to support the benefits of a WHO-style preoperative checklist is mounting – around one-third of briefings where the plan and expectations are verbalized demonstrate utility in the form of resolution of knowledge gaps and identification of problems (*Arch Surg* 2008;143:12-7). Preoperative huddles can also be used to improve the teamwork climate and flatten the hierarchy by using the following phrase, repeated throughout the day: "Anyone can and should speak up if they have any concerns whatsoever, without fear of retribution" (*Br J Oral Maxillofac Surg* 2016;54:847-5). Other techniques that can be used to break the barriers of hierarchy include introductions of all team members by first name, good eye contact, friendly demeanor, responding completely to questions from all team members, especially juniors, and praising assertiveness and suggestions (*Anaesthesia* 2016;71:110-1). The aim is to foster a clinical environment where any professional can challenge another in a non-confrontational manner and without fear of negative consequences.

Senior leaders can also take steps to improve team communication and speaking up by encouraging a "no-blame" culture. A hospital management team perceived as supportive unsurprisingly improves staff confidence that speaking up is effective, valued, and does not invite retribution (*Br J Anaesth* 2019;122:710-3). There are validated tools for organizations to assess their OR cultures, such as the teamwork climate domain of the psychometric Safety Attitudes Questionnaire (*Anesthesiology* 2006;105:877-84). These can be used both to conduct internal assessments and as a benchmark prior to focused human factors-based training programs. The TeamSTEPPS training system developed by the Agency for Healthcare Research and Quality focuses on staff

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development in four core domains: team leadership, situation monitoring, mutual support, and communication (*Am J Med Qual* 2007;22:214-7). These domains or those of the ANTS system (Table 1) could also be used to align incentives to promote better NTS, especially among skeptical team members who initially fail to see the clinical benefit of changing their practice. Furthermore, organizations can offer coaching to providers who struggle to reach competency.

We continue to stress that responsibility for flattening the hierarchy to encourage speaking up lies with senior team members; however, all providers may encounter situations where they are unsure of the correct words or method to challenge a decision. The CUS and PACE techniques (Table 2) are systems designed to express escalating urgency and to gain the attention of decision-makers even within steep hierarchies (*Br J Oral Maxillofac Surg* 2017;55:449-53). The use of swearing in any highly charged situation is to be discouraged as it may be interpreted as aggression and cause escalation of tensions resulting in further patient harm. Sometimes merely breaking the hyper-focus of the decision-maker with a time-out is enough to resolve the situation, with language such as "Please, can we regroup for a second? I am concerned that…" (*Br J Anaesth* 2019;122:767-75).

Table 2: The CUS and PACE Techniques for Escalating Urgency of Communication When Speaking Up

CUS (words to gain attention)	Example for this case
Concerned	"I am concerned that this baby is bleeding."
Uncomfortable/ Unsafe	"I am uncomfortable with the ongoing drain output." "It is unsafe to transfer to the NICU."
Scared	"I am scared that this baby is going to bleed out."
PACE	
Probe	"Do you know that there is blood in the drain?"
Alert	"Can we reassess this patient's bleeding?"
Challenge	"We need to go back to the OR *now*."
Emergency	"Please call the senior surgeon to attend, we are going back to the OR right now."

Br J Oral Maxillofac Surg 2017;55:449-53.

Another technique suited to both peer-to-peer and steep hierarchical communications is that of advocacy with inquiry. This involves stating the observation or opinion (advocacy), followed by a request based in curiosity for the decision-maker to explain their thoughts and reasoning (inquiry) (*Simul Healthc* 2009;4:84-91). Senior anesthesiologists can model this technique whenever they wish to query a diagnosis or treatment plan between themselves or with surgical colleagues. Anesthesiology departments can also agree to support juniors in using the two-challenge approach – whenever a team member has a concern for patient safety that has not been responsively addressed after two attempts at advocacy-inquiry, team members are supported to call for external assistance without fear of retribution. During a postoperative huddle for this case, the initial inquiry could have been, "I see that you are happy to transfer the patient to the NICU, but they have ongoing drain output. Can you clarify your decision?" If no satisfactory response is given, a second challenge is made: "I see that you have cleared the patient for transfer, but they appear to be actively bleeding and I think that we should stay in the OR and re-explore. What do you think?" If the surgeon still gives no satisfactory answer, the anesthesiologist might call for backup or a second surgical opinion.

Effective team working and comfort in speaking up can only be achieved by overcoming the traditional steep hierarchies of medicine, and it is unreasonable to expect individuals and teams to cultivate these essential skills without practice and without support from senior leadership. The "upward voice" is essential not just for patient safety, but across many industries for sharing performance-improving ideas, observations, and knowledge (asamonitor.pub/2R4Ui4z). We wish to thank our colleagues who submitted this case. ■