



APSF.ORG

NEWSLETTER

THE OFFICIAL JOURNAL OF THE ANESTHESIA PATIENT SAFETY FOUNDATION

CITATION: Sherrer DM, Ramsey MM, Thurston K. Collectively intelligent anesthesia care teams. *APSF Newsletter*. 2024;39:23–24.

Collectively Intelligent Anesthesia Care Teams

by D. Matthew Sherrer, MD, MBA, FASA, FAACD; Melissa Mines Ramsey, DNP, CRNA; and Kesha Thurston, DNP, MSHQS, CRNA

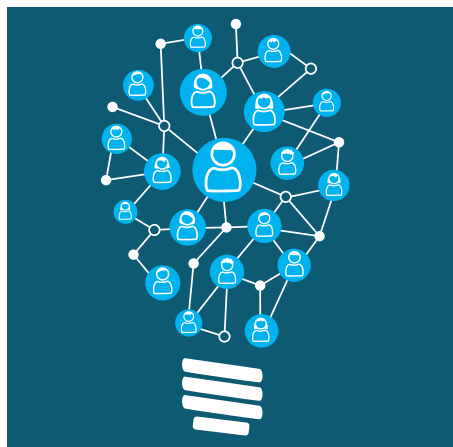
INTRODUCTION

On August 6th, 1997, Guam fire department dispatchers began receiving calls about a fire on a hillside that turned out to be the tragic crash of Korean Air flight 801. Despite efforts by rescuers and emergency personnel, 228 passengers and crew lost their lives in what was later described as a “controlled flight into terrain.”¹ The events surrounding the crash of Korean Flight 801 have been extensively studied, with obvious contributing factors including fatigue, inadequate crew training, and failing monitors and warning systems. However, what still perplexes investigators is the *communication* of the flight crew. News reporter Bernadette Sterne recalls attending a public hearing about the flight a few months after the crash. According to Sterne, “The copilot knew that the pilot was too low. The copilot was trying to tell him, and the pilot was getting mad at him because, you know, he felt it wasn’t his place to question his authority. And then they crashed.”

Further analysis reveals that the copilot recognized the dire nature of the situation early on, as evidenced by his repeated comments about the rainy weather and the plane’s warning systems. However, he did not speak up definitively to the captain, with the command of “let’s make a missed approach,” until six seconds before impact—six seconds before his own death. The captain reacted too slowly to pull the plane to safety. While we will never know why the copilot did not speak up sooner, it has been postulated that a cultural tradition of deference to authority and elders may have contributed. If the copilot had taken control of the plane when he finally spoke up, there was likely enough time to steer clear of the hillside and save the lives of the passengers and crew. Had the pilot and copilot functioned as a collectively intelligent team, the crash could have potentially been avoided.²

COMMUNICATION AND TEAMWORK IN HEALTH CARE

While we would like to believe that communication in health care is better than in the aviation example, statistics indicate there is ample room for improvement. According to the Joint Commission, communication failures account for up to 80% of serious medical errors,³ with teamwork, communication, and human factors identified as the top three causes of sentinel events.⁴ A recent study reported that medical



error is the third leading cause of death in the US, behind only cancer and heart disease.⁵ While some may argue that claim is inflated, the potential follow-up study stating that medical error has been eliminated has yet to be written.

Improvements in teamwork and communication have been shown to not only improve patient outcomes,^{6,7} but can also enhance the mental health of health care workers. For example, residents who viewed their work groups as cohesive displayed less stress and were more satisfied with their jobs than colleagues in less cohesive work groups.⁸ Further, team-building is one of the most useful organizational interventions to improve morale and productivity in the workplace and to ensure the mental and physical health of employees.⁹ So surely then, anesthesia professionals need to dedicate significant time and energy intentionally educating and training on teamwork and communication.

In the perioperative space, a prior APSF article pointed to role ambiguity, stereotyping, and microaggressions among anesthesia professionals as being a threat to both patient safety and wellness.¹⁰ With ongoing provider shortages threatening our practice models and pushing the remaining workforce to exhaustion and burnout,¹¹ there is barely a moment for a lunch break, much less a class or simulation session on teamwork and communication. Although teams can “improve clinical care because they can aggregate and apply a greater amount and variety of knowledge in order to...solve problems...and execute tasks more effectively and efficiently than any individual working alone,”¹² synergy in our perioperative teamwork is extraordinarily hard to

achieve. Every second that we don’t speak up, that we don’t bring relevant information to the table, is a threat to the safety of our patients and to our own well-being.

HUMAN PERFORMANCE IN SMALL GROUPS

Communication and teamwork in health care, especially in the high-stakes environment of the operating room, are critical to patient safety. In the United States, most anesthetics are delivered in some iteration of an anesthesia care team model. If anesthesia professionals champion evidence-based clinical practice, then it follows logically that we should continue to examine the literature related to team performance in small groups. Moreover, we should educate and collectively train ourselves on those topics. To that end, let us now examine various bodies of knowledge on small group performance in search of themes and similarities.

COLLECTIVE INTELLIGENCE

In 2010, Anita Woolley, PhD, and her team at Carnegie Mellon University published a landmark study on “collective intelligence” in small group performance.¹³ The study applied the methods used in foundational psychological studies on general intelligence to groups of two to five members. The team discovered the collective intelligence of a group was a property of the group itself and not just the individuals in it. In other words, the average or maximum intelligence of the team members did not significantly contribute to the collective intelligence of the team. This begs the question, then, if smart teams are not simply teams of smart people, what contributes to a collectively intelligent team?

Woolley’s team found that three primary factors contributed to collective intelligence: 1) the average social sensitivity of team members, 2) the number of females in the group (likely directly correlated with social sensitivity) and 3) a negative correlation with variance in speaking turns.¹³ Teams with socially sensitive team members who equally distribute participation in conversation, valuing the input of *all* team members over a hierarchical communication structure may function most effectively.

See “Collective Intelligence,” Next Page

Intelligent Teamwork Can Help to Benefit Patients and Providers

From “Collective Intelligence,” Preceding Page

Amy Edmondson, PhD, has coined the term “teaming” for teamwork in dynamic environments. In contrast to stable teams, teaming involves working with a shifting mix of collaborators on a range of projects in fast-paced environments where the time between problem identification and solution application is rapidly shrinking.¹⁴ This descriptor might seem appropriate for anesthesia professionals, who may work with different team members every day, providing a variety of anesthetic techniques to an increasingly less-healthy and aging patient population. Teaming requires quickly identifying what collaborators know and what they bring to the table so that tasks with no known solution can be accomplished in short order. As such, Edmondson lists curiosity and empathy as identifying characteristics of a teaming culture. Curiosity drives us to find out what our team members bring to the table and what they can add to the team, while empathy allows us to see another’s perspective, which is critical to effective collaboration under pressure.¹⁴ Sharing the conversation, valuing the input of all team members, and being socially sensitive to other team members’ perspectives contribute to effective group performance.

Similarly, Roger Schwarz, PhD, postulated that a mutual learning model is critical for helping teams develop the trust required to work through difficult challenges.¹⁵ The mutual learning model has core values of compassion and curiosity, in contrast to the unilateral control model, where one person dominates the conversation as a superior under the assumption that they understand the problem, and others do not. Under the mutual learning model, differences are seen as opportunities for learning. Each team member may see things that others do not, and by sharing all relevant information, asking genuine questions, stating interests instead of positions, and jointly designing next steps, trust is increased, conflict and defensiveness are reduced, and solutions are achieved more rapidly and in a way that is more satisfying to team members.¹⁵

THE PATH FORWARD

The Anesthesia Care Team Optimization Committee (ACTOC) at The University of Alabama Birmingham (UAB) has recognized the importance of understanding collective intelligence, teaming, and the mutual learning model and has applied these models to its anesthesia care teams. Under the guidance of a consulting psychologist facilitator and using Schwarz’s mutual learning model as a framework, UAB Medicine CRNAs and UAB Heersink School of

Medicine physician anesthesiologists collaborated to overcome tensions in the operating room and improve the performance of team members, with the goal of delivering world-class care to patients. Emphasizing the importance of the committee, initial group members included the department chair and executive vice chair, division directors, hospital nursing leaders, CRNA managers, and C-suite executives alike. Further, front line anesthesiologists and nurse anesthetists elected to participate in initial meetings were chosen based on the characteristics of civility, inquiry, openness, and the ability to visualize a world where both groups succeed. Both sides acknowledged that patient care was paramount and that workplace tension negatively impacted patient care while contributing to unwellness and job dissatisfaction. The team recognized that each member brought a unique perspective and skill set to the team that, if harnessed appropriately, could allow for synergy in patient care.

After airing grievances and identifying common goals, the team crafted shared vision and mission statements. The effort was then expanded by establishing clinical, teamwork, education, and scholarship task forces, each consisting of seven to ten front line anesthesiologists and CRNAs. To date, these task forces have produced new perioperative communication tools, publications on overcoming anesthesia interprofessional conflict, “lunch and learn” education sessions on clinical topics, and shared journal clubs and social events. ACTOC leaders also regularly present at continuous quality improvement meetings with updates on ACTOC initiatives as well as with invited outside expert presentations on topics such as teamwork and leadership, conflict management, well-being and burnout, and organizational behavior.

Comments from initial surveys indicate that the “temperature” in the operating room has shifted toward warmer and more rewarding interactions. More recent survey responses included comments like “peace in coming to work,” “mutual appreciation stronger,” and “improvement in collaboration.” The guidance of UAB ACTOC has allowed team members to voice opportunities, challenges, and successes in a safe space, and ACTOC leaders receive input from team members regularly to identify areas of success and growth opportunities. The palpable change in culture has led to requests for consultation by ACTOC liaisons both by nursing leadership within the perioperative space, and by obstetric, perinatal, and emergency medicine colleagues facing similar teamwork challenges. Next steps for ACTOC include IRB approved studies related to CRNA and

anesthesiologist perceptions of their ACTOC experience, a formalized curriculum centered around high-performing collaborative teamwork, further expansion of ACTOC principles to multiple UAB-associated community hospitals, and ongoing interprofessional expansion to other colleagues, specialties, and departments within the institution.

CONCLUSION

Advances in evidence, knowledge, technology, and techniques continue to bolster the safety of anesthesia practice. External circumstances, however, continue to place pressure on the very practitioners whose skills and knowledge are required to deliver safe anesthesia at the patient’s bedside. With the collaborative support of and guidance from the UAB ACTOC, our team has shown that civility in the workplace and an understanding and practice of collectively intelligent teamwork can thrive, benefitting patients and providers alike.

D. Matthew Sherrer, MD, MBA, FASA, FAACD is an associate professor at the University of Alabama at Birmingham, Department of Anesthesiology and Perioperative Medicine, Birmingham, Alabama.

Melissa Mines Ramsey, DNP, CRNA is the CRNA educator lead at UAB Hospital, Birmingham, Alabama.

Kesha Thurston, DNP, MSHQS, CRNA is the CRNA manager at UAB Highlands Hospital, Birmingham, Alabama.

The authors have no conflicts of interest.

REFERENCES

1. Dulla NS, Stephens J, Dana Williams. Recalling the crash of KAL Flight #801. Pacific Daily News; 2022. https://www.guampdn.com/news/25-years-later-remembering-kal-flight-801/article_8fced502-120f-11ed-b113-e3f11d784345.html. Accessed April 6, 2023.
2. Gladwell M. Outliers: The story of success. London: Penguin Books, 2009.
3. Joint Commission. Sentinel event data: root causes by event type 2004–2015. www.jointcommission.org. Accessed April 6, 2023.
4. Joint Commission. Sentinel event statistics released for 2015. <https://info.jcrinc.com/rs/494-MTZ-066/images/Sentinel39.pdf>. Accessed April 6, 2023.
5. Makary MA, Daniel M. Medical error—the third leading cause of death in the US. *BMJ*. 2016;35:i2139. PMID: 27143499.
6. Horak BJ, Pauig J, Keidan B, Kerns J. Patient safety: a case study in team building and interdisciplinary collaboration. *J Healthc Qual*. 2004;26:6–13. PMID: 15060954.
7. Gittel JH, Fairfield KM, Bierbaum B, et al. Impact of relational coordination on quality of care, postoperative pain and functioning, and length of stay: a nine-hospital study of surgical patients. *Med Care*. 2000;38:807–819. PMID: 10929993
8. Heyworth J, Witley TW, Allison EJ, Revicki DA. Predictors of work satisfaction among SHOs during accident and emergency medicine training. *Arch Emerg Med*. 1993;10:279–288. PMID: 8110316

See “Collective Intelligence,” Next Page

Intelligent Teamwork Can Help to Benefit Patients and Providers

From “Collective Intelligence,” Preceding Page

9. Guzzo RA, Shea GP. Group performance and intergroup relations. In: Dunnette MD, Hough LM, eds. Handbook of Industrial and Organizational Psychology. Palo Alto, CA: Consulting Psychologists Press. 1992:269–313.
10. Anesthesia Patient Safety Foundation Newsletter. Culture of safety: the multidisciplinary anesthesia professional relationship. Available at: <https://www.apsf.org/article/culture-of-safety-the-multidisciplinary-anesthesia-professional-relationship/>. Accessed June 23, 2022.
11. Medac Anesthesia Business Partners. Anesthesia manpower update. Available at: <https://www.medac.com/anesthesia-manpower-update/>. Accessed June 23, 2022.
12. Larson JR. In search of synergy in small group performance. New York: Psychology Press, 2010.
13. Woolley AW, Chabris CF, Pentland A, et al. Evidence for a collective intelligence factor in the performance of human groups. *Science*. 2010;330:686–688. doi: [10.1126/science.1193147](https://doi.org/10.1126/science.1193147)
14. Edmondson, AC. (2013) The three pillars of a teaming culture. Harvard Business Review (online article). <https://hbr.org/2013/12/the-three-pillars-of-a-teaming-culture>. Accessed April 6, 2023.
15. Schwarz, RM. Smart leader, smarter teams: how you and your team get unstuck to get results. San Francisco: Jossey Bass, 2013.