

## THE 2023 JOHN M. EISENBERG PATIENT SAFETY AND QUALITY AWARDS: INDIVIDUAL ACHIEVEMENT

# An Interview with Eduardo Salas, PhD

*Interviewed by Eric J. Thomas, MD, MPH*

**You have spent much of your career studying teams. What was it about teamwork that got you so fascinated that you pursued a career studying it?**

It all started in graduate school at Old Dominion University (Norfolk, Virginia) where I got my doctorate in Industrial and Organizational Psychology. I took a class with one of my advisors, Al Glickman, on team dynamics, and I got hooked on the topic. I thought it was interesting and challenging. It still is today. Shortly after I graduated, the US Navy (the Naval Air Warfare Center-Training Systems Division) in Orlando, Florida hired me to develop a team training and performance research portfolio. I liked the idea and accepted this job in 1984. As I visited Naval training facilities, and in working with sailors, marines, units, and crews, I learned the value of “the team.” I realized how much they appreciated their teammates and looked for them to be supportive and reliable, that they were there when they needed them, that they had their back, and that they shared the same goals. I learned that teamwork meant something more than just being buddies—their lives depended on their teammates and on good, effective teamwork. I realized how much teamwork mattered—it could save their lives! This was a powerful motivation for me, and for my colleagues. We have to help, we thought. We focused on how we could use science to inform us on how to help them. And we did.

**Some readers may not be familiar with the discipline of industrial and organizational (I/O) psychology. Can you provide an overview and tell us how I/O psychologists can contribute to healthcare quality and safety?**

I/O psychology is the science and practice of people at work. It is a field that focuses on workplace issues at the individual, group, and organizational level. We conduct research on improving the well-being and performance of individuals, as well as the organization that employs them. So our topics go from personnel selection, to training and development, to diversity, to managing work teams, to leadership development and organizational change, to name a few. We believe in the scientist-practitioner model as the

most interesting and impactful approach. That is, science guides practice and practice influences science. I am a big believer of this model; it is my *modus operandi*. I also play in the human factors space. This field studies how people interact with machines, systems, and technology. It is about human system integration with a focus on performance, effectiveness, and safety. I hope you can see why both fields matter to patient safety and quality. Both are needed in the quest of mitigating errors and increasing safety. In fact, I once read a statement from a human factors scientist that “the solution to medical errors is not in medicine but in psychology, engineering.” It is a partnership behind those that understand human performance and those who know the clinical context. All my years in healthcare, I have sought partnerships with clinicians. It is a must to have impact.

**You have studied teams in the military, NASA, the petrochemical industry, commercial aviation, healthcare, and other industries. What is the most unusual or interesting team or team environment you have studied?**

I think they are all interesting. What makes them interesting is that if you are going to help these teams, you need to understand their context. That is, one needs to understand the conditions under which they perform. I learned that studying teams in the Navy. So to me, the interesting part has been immersing myself (and colleagues) in their environment. It is fascinating what you learn. First, you realize how complex, stressful, dynamic, and messy their environment is. You are in awe at what you see. I have experienced that in healthcare. The ICUs, the ORs [operating rooms], the NICUs [neonatal ICUs], and more. Then, you think, yes, our science can help.

For example, I had the opportunity of spending a few days and nights at a busy ICU. It was incredible to see how the care team goes from peaceful moments—all quiet and uneventful—to chaos—triage around an unexpected patient event—in a matter of seconds! To see how they perform under time pressure, with information ambiguity, as they are diagnosing what they have in front of them and successfully take care of the patient is amazing. I have seen similar events and care in NICUs.

I learned three things in these team settings. First, the care team needs to hold accurate shared mental models of the patient conditions, their teammates, and the equipment

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available to them. These care teams must share an understanding of the patient condition, needs, and prognosis. Team situation awareness matters here. Second, in order to have this shared understanding, the handoffs and periodic huddles (updates on patient condition) are imperative. The handoffs need to be perfect—robust. The huddles must be informative, be accurate, solve a current conflict or ambiguity, and be predictive of potential unexpected events. Team-STEPPS teaches that. The third insight was how role clarity helps with teamwork. When teammates know who is responsible for what and hold a shared mental model, the care team functions effectively and efficiently. Clearly, the big challenge in healthcare is that teamwork fluctuates immensely; it is very dynamic and episodic and requires many transportable team-based competencies to function effectively.

**With the wide variety of settings, patients, and care processes in healthcare, I know it is hard to generalize. But given your vast experience in healthcare, what are your overall impressions of teamwork in this industry?**

Let me start by saying everyone thinks they are different. When I was with the Navy, I would hear, “that is for the CH-46, we are the V-22.” Same in healthcare: “that is ICU, we are ER [emergency room].” But the big equalizer, I think, is task interdependence.

What makes the findings and discoveries from team science generalizable to healthcare (and beyond) is the level of task interdependence that teams members have. When there is some degree of task interdependence—that is, team members need somebody else’s expertise or knowledge to complete a team task—our findings are generalizable. But context matters. So the findings have to be contextualized to fit. For example, we know that teams that have psychological safety learn more, exchange more information and, are better able to resolve conflict. In healthcare, boosting psychological safety is a must for safe patient care. I have seen how this can be successfully promoted in some settings—for example, before starting a round. The attending begins by stating, “I like to be challenged.” In the OR, when the surgeon opens with “I am Dr. X; I am vulnerable to error. I need your input. Be vigilant. Speak up; we are a team.” These brief statements create opportunities for teammates to speak up without fear of repercussion.

Now, I will say that in my almost 25 years studying and observing teams in healthcare, I have learned how much teamwork matters to prevent errors and lives. This is nothing new or surprising. And while I have seen some progress over the past 25 years in health systems efforts in creating a culture of teamwork, much more is needed. We know that medical team training works when designed and delivered following the science of team training, that the evaluation data is compelling—it’s not perfect, but we know it yields desired outcomes. So, the next step is to determine how these behaviors, cognitions, and attitudes can be sustained

over time. That really requires the engagement of the C-suite. They must create the supportive organizational conditions needed to ensure that teamwork gets engrained into the DNA of the organization. They must design and create the policies, mechanisms, and norms for teamwork. They create the mechanism for ensuring that teamwork is valued across the organization and for promoting collaboration and psychological safety. The C-suite send signals that teamwork matters in the hospital and throughout the organization. I am a believer that organizations get the behaviors, cognitions, and attitudes that are measured and reinforced. Period.

I need to note that organizational change is not easy; it takes time, resources, effort, and a long-term commitment. In some of the healthcare systems I have had the privilege of observing and/or advising, I’ve seen how the senior leadership engages in a few initiatives to start the process of change. These include, for example, adapting Team-STEPPS to fit their norms and culture; they created Patient Safety Day(s) of Excellence, and teamwork is central to that day; they designed and launched a team training curriculum (in a teaching institution) to teach teamwork early to medical students; they supported and encouraged the use of simulation to ensure that team-based competencies stick; and they created teamwork labs (units in hospital for pilot testing) to collect local data to be used later to scale up the team training.

Lastly, an idea I’ve had for some time, as a way to send signals to the workforce that teamwork matters, is for a hospital to appoint a Chief Teamwork Officer. Maybe someday I’ll see that.

**What advice do you have for frontline clinicians who want to improve the effectiveness of their teams?**

There are a set of core team-based competencies that matter in teams that have some degree of task interdependence. Relying on the science—and my 40 years of researching teams in many settings like the military, aviation, oil and gas, space exploration, and many other places where effective teamwork matters—I think these are the key features:

- Ensure teammates have role clarity and know who is responsible for what.
- Promote psychological safety so the team members are more likely to learn from mistakes.
- Develop shared mental models—an understanding of goals, procedures, and the norms of how to behave.
- Have precise information exchange protocols and share unique information.
- Lead as a coach—promote, develop, guide, and reinforce teamwork.
- Set expectations that are clear and understandable.
- Allow and support self-correction. That is, use huddles and debriefs to improve teamwork.

- Develop team norms—performance conditions that are known, clear, and appropriate.
- As leaders of teams, foster conditions (e.g., policies, measurement, reinforcement) that signal that teamwork matters and that is valued.
- Use the science of teamwork to guide the team development initiative.

I would add, and want to highlight, that the most powerful team development intervention frontline clinicians have available is debriefing—having the opportunity to reflect, self-correct, learn, and set future goals for improvement. The data is clear on its efficacy. Of course, the challenge is having the time and discipline to do this.

**What are some recent research and practice developments in the field of team science (in healthcare or elsewhere)?**

There are some exciting research ideas that are emerging in healthcare and beyond. One is a deeper understanding of the “team of teams” approach. This is especially important

in cancer and primary care, for example, to improve the quality of care and handoffs. This is research that is very difficult and time-consuming to execute. But it is needed. We need the principles that can help a team of teams improve, self-correct, manage conflict, and deal with member fluidity.

Another exciting area is to consider that, in the future, your teammate might be automation or a robot. There are some promising efforts to study human-robot teaming.

Finally, there is a need for research that explores low-level measures of teamwork. I believe we need on-line, dynamic, unobtrusive measures that can help diagnose how a team is doing as they perform. So, measures that track the behavioral, cognitive, attitudinal, and other biomarkers that triangulate teamwork is a much-needed tool.

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