SOARING to SUCCESS

Taking Crew Resource Management from the Cockpit to the Nursing Unit

Gary L. Sculli, RN, MSN, ATP

David M. Sine, MA, CSP, ARM, CPHRM

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Gary L. Sculli, RN, MSN, ATP

Gary L. Sculli, RN, MSN, ATP, brings a unique and diverse perspective to patient safety with his background as both a clinician and an airline pilot. He has been a registered nurse since 1986 and has practiced in multiple clinical specialties including medicine, general surgery, ENT oncology, orthopedic surgery, neurology, and neurosurgery. He has experience as a nurse educator, nurse manager, and completed a tour of duty as an officer in the United States Air Force Nurse Corps, Lackland Air Force Base, TX.

Sculli is also a former airline pilot with experience flying turboprop and jet aircraft at the regional and major/global airline level. His flying background includes experience as a captain, first officer, and aircrew instructor, and FAA certified line check airman. He has conducted airline training in state-of-the-art aircraft simulators and has developed and taught airline crew resource management (CRM) programs.

Sculli currently works in patient safety at a national level. He is an accomplished presenter and patient safety consultant. He has extensive experience developing and delivering clinical programs that apply CRM and human factors concepts directly to frontline nursing practice and interdisciplinary healthcare teams.

He holds an airline transport pilot certificate with three type ratings. He received a BSN from Thomas Jefferson University in Philadelphia and an MSN from The University of Memphis.

David M. Sine, MA, CSP, ARM, CPHRM

David M. Sine, MA, CSP, ARM, CPHRM, has more than 30 years of healthcare safety and risk management experience in private and public sector health systems. He currently serves as a member of Joint Commission's Committee on Healthcare Safety, and acts as a risk management and patient safety advisor to the National Association of Psychiatric Health Systems.

Sine was formerly a senior staff engineer for The Joint Commission, a senior consultant for the American Hospital Association, and a vice chair of the board of Brackenridge Hospital in Austin, TX. He was the inaugural contributing editor for *Briefings on Hospital Safety*, published by HCPro, Inc., and *Quality Improvement Techniques for Hospital Safety*, and is the coauthor of the *Design Guide for Behavioral Health Facilities*, published by the National Association of Psychiatric Health Systems.

He is a past chair of the American Society for Healthcare Risk Management ethics committee (2009), and has been the Spencer Educational Foundation risk manager in residence. He has published numerous articles and is a frequent speaker at national and regional educational programs.

His research interest is the intersection of risk management, patient safety, and ethics. He holds a degree from the School of the Art Institute of Chicago (SAIC) in design and from Loyola University in bioethics and health policy. He divides his time between Ann Arbor, MI, and Austin, TX.

How to Read This Book

This book is designed to give you an overview of nursing culture and an explanation of crew resource management and airline safety practices in the first two chapters. Chapters 3 and onward provide practical discussion of various principles that you can use to improve communication, leadership, and safety practices on patient care units.

It is entirely acceptable to read the book in page order, but it is also acceptable to skip ahead to a specific chapter if you have a particular interest in its content and do not want to wait. The chapters are designed to flow consecutively, but they are also self-contained modules that stand alone nicely.

You will notice numbered sidebars written by the book's coauthor, David Sine, arising from the main body of text within the chapters. Much of the book is written in narrative form. The narrative content is based on my experience and current literature. To a much larger degree, the sidebars provide an academic and literature/research base contribution that strengthens the manuscript.

However you choose to proceed, we hope you will use the book as a reference long into the future.

Gary L. Sculli, RN, MSN, ATP

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Gary L. Sculli, RN, MSN, ATP

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David M. Sine, MA, CSP, ARM, CPHRM

Foreword

For more than a decade, patient safety has glowed brightly on the radar screen of not only health professionals but also on the radar screen of the media and patients. There has been no shortage of catastrophic events that have appeared on the front page of newspapers or been the subject of media coverage documenting tragedies that have affected patients in the course of their healthcare. Examination of the root causes and contributing factors that led up to these terrible events have consistently identified communication as the most common underlying causative factor. The critical role of communication is common to most human activities and is not unique to healthcare. When communication problems arise in the majority of human activities, the result is not the death of the participants. There are, however, some industrial, commercial, and professional activities in which the penalty for communication failures is death or major injury. Aviation and healthcare are two such endeavors in which the penalty for less than clear and effective communication can be catastrophic.

Authors Gary Sculli and David Sine have taken advantage of the opportunity to contrast the aviation industry and how it effectively dealt with communication challenges through the use of crew resource management-based techniques, with the general lack of coherent practices to deal with similar communication problems in healthcare. This book illustrates how principles and lessons learned in the aviation environment such as structured communication, checklists, teamwork, task sharing, situation awareness, and elements of human factors can be applied to the challenges presented in healthcare. The authors have clearly understood that there is no magic bullet to deal with the challenges in today's

high-risk and technologically complex healthcare environment and have taken a systems-based approach to provide a useful multipronged methodology. This variety of techniques equips the reader with a formidable armamentarium to deal effectively with communication challenges on the nursing unit and may assist in providing higher quality and safer patient care than in the past.

Until recently, healthcare did not fully recognize the profound effect flawed communication could have on patient care and, even more importantly, did not routinely have access to the tools to assist in dealing with these issues. *Soaring to Success*, through the use of engaging personal examples from the authors' own unique experiences in aviation and healthcare and well researched references, gives us such a tool.

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Preface

September 11, 2001, changed many lives. It irrevocably changed mine. I will never, as long as I live, stop reflecting on what happened to the victims that day and what they endured, especially those who experienced unimaginable terror on those airplanes. I admit, as the years slip by, my pensive moments about this apocalyptic event come less often; but as is the case with so many of us, I will never forget what happened, and I doubt that I will ever get to the point that it does not affect me viscerally.

On September 10, 2001, I flew as first officer on a Northwest Airlines DC-9 from Minneapolis-St. Paul to Memphis, TN. We arrived around 1200 central time after an early start in Minot, ND. How could I possibly know that this would be the last landing for me where life as an airline pilot seemed so full of promise? It seems tragically ironic that on the day prior, while in my hotel room, I watched the Secretary of Defense Donald Rumsfeld appear on one of the Sunday news shows talk about Israel and terrorism. He explained that the Israelis had a much greater problem in dealing with terrorism than we did here in the United States, because unlike us, it surrounded them. The fact that it occurred in their country, on their soil, mandated that they deal harshly with acts of terror and violence. As Mr. Rumsfeld said this, it was implied, even taken for granted, that we were insulated from such things here in the United States. Little did we know what was headed our way.

In the days following the attacks of 9/11, it became apparent that I was going to be laid off from the airline. I was at the bottom of the seniority list, and in the airline world, seniority is job protection. As time went on, I saw that the layoff was going to be protracted, so I

prepared to re-enter nursing, a profession I had practiced for nine years before transitioning to the airlines. Although I had practiced in multiple clinical specialties on all shifts—both as a military officer and civilian employee—I did not anticipate the experience that awaited me.

My first position upon my return to nursing was as a nurse educator with a local healthcare system. Half of my time was spent teaching new hire orientation, which I enjoyed thoroughly, and the other half as a unit-based educator on an oncology unit. It was here that I began to realize my view of nursing as a profession had changed and that I now approached it from a completely different perspective. I was looking at nursing through a different prism. When I later moved into nursing leadership as a frontline nurse manager, this realization was reinforced.

This book is about that very realization: transitioning from an industry that consistently functions and perpetuates a culture of safety, back into nursing, a noble profession that articulates desired patient outcomes quite well, but often fails to provide its personnel with the tools, resources, and environmental conditions for such outcomes to take place.

I firmly believe that clinical nursing, especially in the multibed medical-surgical specialty, will benefit enormously from the application of some of the most basic tenets of crew resource management (CRM), a program that has transformed the airline industry and changed the manner in which flight crews interact to ensure passenger safety. CRM can transform nursing practice at the front line as well. I have seen this firsthand. It facilitates environmental changes, clinical processes, staff attitudes, and behaviors that hold true to the edict "first do no harm."

In addition, the airline industry has other safeguards and supplemental practices that ensure operational safety, which can be combined with CRM and exported to nursing practice.

In a sense, this book is a second chance. During my first tenure in nursing, I felt uneasy and frankly dissatisfied with many of the cultural norms and processes in place. Not only did the

culture create vulnerabilities for patient safety, it also induced profound stress and dissatisfaction for the many professional nurses who tirelessly dedicated themselves to caring for the sick. These realizations were clear to me; yet I wasn't sure how to fix these problems. I admit I stepped back and left the profession, as so many nurses do. Call it a divine plan or call it fate, but I had a chance to come back to the profession with knowledge I did not have before, a chance to offer solutions that can make a difference for nurses and patients.

The book is written by a nurse who happens to be a former airline pilot, not the other way around. This is an important point. This book's premise is not that aviation is the savior that has finally arrived to fix the ills within professional nursing. On the contrary; a fundamental paradigm here is that nurses are not pilots and patients are not airplanes. CRM concepts must first be modified to fit the unique environment and culture in which nurses practice, then applied to the clinical area. The differences between the unpredictable world of patient care and the often controlled and knowable responses of aircraft must be taken into account. Simply dropping in aviation tools and practices on the nursing unit without adaptation will not work. That said, there is much to learn from the airlines, a decidedly reliable, safety-sensitive industry that enjoys a high degree of operational safety.

I am a nurse. I have lived in the culture and intimately understand the pressures and forces that affect a nurse's ability to keep his or her patients safe. I am also a pilot. I have lived in the culture and understand the dynamic environment that defines the airline cockpit. Please join me as we go from the cockpit to the nursing unit, a journey that ultimately benefits our patients.

Gary L. Sculli, RN, MSN, ATP

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CHAPTER 1

Nursing and Aviation:
A Culture Comparison

LEARNING OBJECTIVES

After reading this chapter, the participant will be able to:

- Describe the professional cultures of aviation and nursing

- Identify the way nursing culture contributes to patient safety

The purpose of this chapter is to provide an overview of two professional cultures: aviation and nursing. It is important to remember that this overview is general in nature and largely based on my experience and perspective as I moved from the cockpit to the nursing unit. More detailed discussions of the concepts mentioned here occur in later chapters and will be referenced accordingly.

The airline culture is not perfect. Nothing involving human endeavor ever will be. It is, however, what I consider a true culture of safety. When I left the cockpit in 2002 and returned to nursing, I quickly reacclimated to the language and flow of the profession. But, this time something was clearly different, and I knew it right away. My cultural paradigm had completely changed. My expectations for nursing regarding levels of standardization, training, task load management, and communication styles were not the same as before. As I compared my experiences in the cockpit and my indoctrination into the airline culture to what I was currently encountering as a nurse,

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I soon realized that I was in a state of culture shock, plain and simple. Reality was not matching my expectations. ◆

I have always known that nurses are dedicated professionals who strive for excellence, yet now I was perplexed, even alarmed, at how many of us—at all levels of practice (including nurse leaders)—accepted vast shortcomings in the culture with regard to patient safety.

There seemed to be a palpable sense of resignation when discussions of these shortcomings emerged. For example, I would often hear stories or witness firsthand situations in which physicians purposely intimidated nurses during the course of communicating clinical information. Sometimes there would be yelling, berating in front of patients and families, pointing of fingers, tossing of objects, sarcastic responses to questions, hanging up the phone, and … well, the list goes on.

I knew this type of behavior existed on nursing units. I experienced it myself while practicing years earlier, but now it seemed unimaginable to me and I could not accept it. I would fervently discuss, with anyone who would listen, the simple fact that these communication patterns drastically undermine patient safety and should not be tolerated.[3] I would go on to describe how in the cockpit such behavior would be considered deviant, not common place, and was trained out of the culture long ago. Although many nurses agreed, all too often they would slowly shake their heads back and forth as if to say, "I hear you and I concur, but that's just the way it is."

How could this be? How can a culture with so much at stake function successfully when people—who are supposed to be on the same team, working toward the same goals—cannot talk to each other? How can a culture proclaim that it is safe when some professional groups within it are afraid to speak up if they see a problem or have a question? Communication was not the only cultural challenge that struck me this way. There were many others, and collectively they are deeply problematic for nurses as they care for their patients on nursing units.

This is in no way an indictment of nurses or nursing. On the contrary, it is simply an acknowledgment of the disconnect I experienced after honestly assessing the systems and culture that define professional nursing when compared to a high-reliability industry like aviation—and that is the key here. Nurses are perceptive and smart. I was not pointing out anything they had not already endured or seen. The difference, however, was that I had

spent years in a safety-sensitive industry and seen it done in a different way, with excellent results. There are many similarities among nurses and pilots. They are both responsible for the safety of other human beings, and they operate in situations where mistakes can mean the difference between successful outcomes or loss of life. Culturally, however, there are significant differences. ◆

In my mind I envisioned a blank page with a thick black line down the center. On one

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◆ Sidebar 1.2
Preserving a group's culture

Of the numerous (and arguably equally valid) operating theories and definitions of culture, nearly all share one common aspect: the idea that certain things in social groups are shared or held in common.[4] Behaviors by group members reinforce these values and members tend to behave in ways that teach these practices to new members, rewarding those who fit in and sanctioning those who do not. In this manner, the group behavior persists and the values are preserved over time even when group membership changes.[5]

For new group members, the central-most values of an organization are at first as opaque and mysterious as they are to any outsider. For the newcomer, the threat of punishment for irregular behavior is possibly a more significant motivator than any vague perception of a potential reward that awaits attainment of "insider" status granted though a shared taxonomy and knowledge of the organization's symbols, rituals, and stories.[6]

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side was the airline culture, and on the other side nursing. As I filled in the description of the cultures on each side of that line, stark contrasts emerged. Let us compare the two cultures.

Aviation Side of the Line

Team

At the airlines, there is a heavy emphasis on team training and team-building behaviors in the cockpit and beyond. This is the very essence of crew resource management (CRM), a program that has at its core the essential skills required to promote teamwork and effective communication (see Chapter 2 for a detailed explanation of CRM).

Teamwork and team-oriented behaviors are not only discussed in the classroom, they are reinforced and applied during flight simulation training sessions. Each member of the crew has specific responsibilities for keeping the team intact and functioning so that important flight information is communicated in a timely and effective manner. It is understood that while leaders ultimately make operational decisions, all members of the team must partici-pate and play an active role in the decision-making process. This is not only encouraged, it is expected. As leaders, airline captains fully assume the fundamental responsibility of building and maintaining the team. In large part, their effectiveness as leaders determines the effectiveness of the crew as a whole. To that end, captains learn and implement specific behaviors to ensure their team is engaged and speaking up when necessary (see Chapter 4 for a detailed discussion of leadership and team-building behaviors).

CRM training also emphasizes the other side of the team equation, focusing on the crucial roles and responsibilities of those who support the captain. Subordinate crew mem-bers learn to use tools that allow them to communicate information effectively and assert their concerns to gain clear resolution when safety is in question. In the cockpit, followers are equally responsible for team outcomes (see Chapter 6 for a complete discussion of effective followership).

From the date of hire at an airline and through initial training, new pilot hires are paired and train together as a crew. As they move through the various phases of simulator training, the crew understands that while each member is being evaluated individually, their ability to successfully complete training depends in large part on how well they work together as a team. Pilots carry this with them beyond the training environment. They know full well that a strong sense of team, coupled with open communication, is their most effective tool in managing error and avoiding mishaps. As we discuss in Chapter 3, the definition of the airline team is not confined to the cockpit, but includes many other players such as flight attendants and maintenance personnel. The key point is that the team umbrella is large enough to ensure that the observations and contributions of those outside the cockpit are not ignored.

Human factors

Another important focal point in the airline culture is an awareness of human factors and the limitations of human performance (also included in CRM training). ◆

This is generally discussed within the context of situational awareness (see Chapter 7 for a full discussion of situational awareness). Specifically, pilots are taught to be acutely aware of fatigue and its effect on

◆ Sidebar 1.3

A whole-systems approach to human factors

Human factors have come to mean almost exclusively the human machine interface. However, in this book, the term "human factors" refers to the processes and factors that influence the behavior of people.[7] The full scope of human factors research may involve the human-to-human or human-to-environment interface in any work environment and include the disciplines of cognitive and perceptual psychology, engineering, architecture, industrial design, statistics, operations research, and anthropometry. No matter what interface is of interest, the goal of human factors inquiry is to understand and minimize incompatibility between people and the things we create and use.[8, 9]

crew performance and decision making. There is regulatory protection in place, which mandates how long a pilot can be at the controls in a single day, how long a pilot can be available and on duty, and how much rest must occur between duty periods. Although

these protections are not foolproof, these Federal Aviation Administration–mandated protections do exist and they are strictly followed. Pilots at most airlines have the option to "call in" fatigued without penalty if they feel that they cannot fly safely. While this option should be used judiciously, it is an available safeguard and can identify systems issues that may create patterns of fatigue among flight crews. ◆

◆ Sidebar 1.4
Patient safety and fatigue

Patient safety studies have shown that hospital nurses have significantly decreased levels of alertness and an increased likelihood for errors and close calls when working extended shifts.[10, 11] The detrimental effects of fatigue also include negative effects on personal health, job performance, and professionalism. Long and often unpredictable hours to cover staffing vacancies, minimal recuperation time, and often unrealistic workloads appear to be a contributing factor in nurse absenteeism and job dissatis-faction.[12] One study found that job dissatisfaction among hospital nurses was four times greater than the average for all workers in the United States.[13]

Incorporated into general operating manuals are information on restrictions surrounding the use of alcohol, strategies to optimize the use of caffeine, and how the ingestion of these substances can affect the ability to obtain restful sleep. The effect of life stressors on perfor-mance is openly discussed in the culture. Pilots are encouraged to monitor themselves and each other for the negative effects caused by stress. It is not uncommon for one pilot to ask another who is struggling with a divorce or death of a loved one, "Are you OK to fly today?" The key point is that there is a heightened awareness and active monitoring in the culture for the deleterious effects of stress on performance and operational safety. If it is best for a crew member to be temporarily relieved of flight duties, then that action is within the realm of possibility.

Pilots internalize paradigms and learn procedures that facilitate the safe use of technology as their cockpits become increasingly automated. In addition, there is an unequivocal recognition of the negative effects of distractions on cognitive processes. In the airline

cockpit there are rules and procedures that serve to reduce distractions and the effects of extraneous interruptions during critical flight regimes (see Chapter 7 for a complete discussion of the "sterile cockpit" rule). Critical flight regimes are those phases of flight that are task loaded, where vigilance and attention to detail are required to ensure safety. An example of such a regime is when an aircraft is taxiing. While operating on the ground, pilots must maintain awareness of their position relative to other aircraft and active runways, listen and respond to instructions from air traffic control, and complete checklists to ready the aircraft for takeoff. Pilots know well the consequences of losing focus during such times and are expected to remain disciplined and focused throughout.

Human factor awareness is something that emerges at the earliest moments of a pilot's training. For example, when fledgling aviators are first learning to fly an aircraft without visual reference to the natural horizon (called flying by the instruments or flying in instrument meteorological conditions), they must be disciplined enough to ignore the feelings and sensations that their bodies give them and force themselves to rely only on the instruments in front of them. In other words, maintaining aircraft control without the ability to see outside the cockpit requires that pilots respond to what they see inside, not what they feel. Many times the conflicting information between the inner ear and optic nerve can cause overwhelming disorientation. If not managed appropriately, pilots may actually apply pressure on the controls incorrectly without realizing it, placing the aircraft in a dangerous descending spiral. Recall the well-publicized accident of John F. Kennedy Jr., an inexperienced pilot who lost control of his aircraft and plummeted into Nantucket Sound in low visibility. This point underscores the awareness that pilots must possess, almost from the beginning, about the dangers of mismanaging human limitations.

Standardization

Standardization is a staple in the airline industry. There are countless acronyms in the airline vernacular that include the letter "S," which represent the word "standard." Standardized procedures, maneuvers, and actions are ingrained in the culture. In fact, as a pilot, it is the most egregious insult if someone were to describe you professionally as "nonstandard."

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If I were to ask you what is good about standardization, or what does standardization achieve for us as professionals, what would you say? Clearly one answer is that standardization essentially tells us what to do. It ensures that everyone is completing a task or procedure in the same manner. It puts everyone on the same page, reduces variability, and is a critical element in the airline culture. For example, a pilot might fly with 15 different people in a given month. Being standardized means that any two pilots can work together seamlessly in the cockpit and know exactly what to expect from each other regardless of who they are, what their personality types are, or what side of the bed they got up on that morning. It is understood that checklists will be read and responded to in the same way, the aircraft will be configured for takeoff and landing in the same way, and crew callouts and briefings will occur at the same time every time. Who makes up the crew does not affect standard operating procedures. There can be variations in pilot technique and personalities, for sure, but operations are spelled out, everyone is on the same page, and compliance with SOPs is a way of life.

Another important gain from standardization is the fact that it allows us to readily predict behavior. This means that if a crew member does not say or do what he or she is supposed to, when he or she is supposed to, it needs to be investigated immediately. Perhaps this individual is incapacitated, perhaps ill, or maybe fatigued and experiencing low situational awareness. In the cockpit, when someone fails to carry out routine actions as expected, it gets the team's attention.

Some might say that standardization is a bad thing, that it stifles the ability to provide care in a manner that considers each patient as an individual, or that what is good for one is not good for all. I appreciate this concern and would respond this way. First, standards are evidence-based, not arbitrary; it is not wise to practice outside guidelines and protocols derived from data that are results driven. Second, standardization does not preclude considering each patient's individual differences in the implementation of care. For example, a standard may mandate that a nurse conduct preoperative teaching, but how the information is delivered depends solely on the patient's individual method of learning. The standard, preoperative teaching is clearly good for all; the method of delivery is not and therefore is expected to be

individualized. Last, standardization also allows for variations in clinician technique when delivering care. Think about the many variations in technique for giving an injection or starting an IV; however, with all of these variations, aseptic standards are still met.

Recurrent training and performance checking through simulation

When pilots are first hired, they go through initial training, part of which is called "indoctrination." Here is where pilots learn the general operating rules and guidelines of the airline. What to do in the case of hijacking, minimum distances to stay clear of thunderstorms, how to handle a sick passenger or bomb threat, proper dress codes, and how much crew rest is required before attempting to fly. Another segment of the initial training is where the pilot learns the systems and cockpit procedures for the particular airplane they are going to fly. This usually includes a combination of classroom and procedure training, which uses static and full motion simulation. The simulator is an exact replica of the cockpit and provides a level of reality that is nothing short of stunning. When pilots emerge from this training, they are ready to go to the line and fly the aircraft with passengers on board. This is where additional training, called initial operating experience (IOE), takes place under the watchful eye of a check airman (just like a preceptor in nursing). When IOE is complete, pilots are released from training and become available to crew scheduling for flying assignments. The entire process takes approximately six weeks.

In the training described, there are points to evaluate a pilot's knowledge and performance. Knowledge testing takes the form of computerized testing and/or oral evaluations. Performance testing takes the form of what is called a check ride. Here, pilots fly the simulator and must demonstrate proficiency and execution of specified aircraft maneuvers within certain tolerances. They also must demonstrate the appropriate management of aircraft emergencies such as an engine failure or rapid depressurization at altitude. The crew is also evaluated on their performance as a team, as they work together to problem solve abnormalities. The check ride is about performance under observation and pilots understand this. Most learn early on in their careers to find ways to manage the natural anxiety that accompanies such an event.

As time goes by, pilots become lulled by the normalcy of operations. Aircraft systems and procedures begin to get a bit hazy and difficult to recall. For this reason, the airline industry practices recurrent training and performance checking. This means at specified intervals (every 12 months at a minimum) pilots go back to the classroom to revisit the salient policies and procedures of the airline. They may review important safety topics and lessons learned from industry accidents or mishaps. They review aircraft systems and operating limitations, along with any significant changes to airline procedures. They also complete a recurrent check ride in the simulator as previously described. Recurrent training and performance checking is one method the airline culture uses to manage the natural tendency for human beings to become complacent over time. Pilots emerge from recurrent training with revitalized knowledge and confidence, which creates margins of safety in the operational environment. (For a complete description of recurrent training and performance checking and how it can be applied to nursing practice, see Chapter 9.)

Checklists

Pilots live and die by checklists—literally. Aviation history has its share of mishaps that can be traced back to poor or absent checklist utilization. This is the rare exception, not the rule. I mentioned earlier that standardization is a staple in the airline industry; the same can be said for checklists. Pilots discipline themselves to adhere to checklists consistently and without question. This does not imply that checklists are used without judgment, but it does mean they are consulted at specific points during all phases of flight to support memory and situational awareness.[14] It is not unreasonable to say that checklists are the backbone of the airline safety culture.

Checklists are used differently depending on the situation. For example, the manner in which a pilot uses a checklist in an emergency varies significantly from how it will be used for routine scenarios. In fact, the checklists themselves look different in terms of presentation and structure. Differences in checklist philosophy and presentation ensure ease of use and optimal support of human memory. If you are a nurse who has practiced on the unit, think back to a time that you used a checklist in practice. Was it easy to use? Did it make sense?

Did it make your job easier or create more work for you? As discussion about the use of checklists to support patient safety heats up, nurses will experience increasing pressure to use checklists in practice, which is a good thing. However, it is imperative that nurses develop checklists using the appropriate philosophy, matching the checklist's format to the task at hand. An extensive discussion about creating checklists to best support nursing practice can be found in Chapter 8.

This concludes the overview of the aviation culture, and it's time to move on to nursing. Before we do, I feel the need to quote that famous robot from the TV show *Lost in Space*: "Warning Warning, Danger Danger!" There may some unpleasant reading ahead. As I stated earlier, the aim of this chapter is to provide a quick culture comparison based on my vantage point moving from the flight deck to the nursing unit. It is important to keep that in mind, as well as the fact that while we may identify cultural deficiencies, the book is not about decrying problems, but using CRM to solve them. Now that I have covered aviation, let us look at the nursing side of that big black line dividing the cultural page that I envisioned earlier.

Nursing Side of the Line

Hierarchy

Right away, it was apparent to me when I returned to nursing that there are cultural roadblocks to effective communication. Most salient is the hierarchical nature of relationships between members of the patient care team on the nursing unit. Although nurses have information transfer failures within their own team structure, the most clear and present danger to patients can be found in the intense authority gradients existing within the nurse-physician dyad. History demonstrates that, in general, healthcare relationships have been characterized not by open communication and team orientation, but by an emphasis on centralized power in decision making.[15] For nurses, this is all too apparent as they often experience adversarial responses, poor behavior, and unpredictable reactions from medical decision makers while attempting to manage patient problems.

Soaring to Success

Missed meals

In a way, it seems paradoxical that nurses who spend incredible amounts of time in school learning about the physiology of the human body can live in a culture that quietly avoids serious discussions regarding how human limitations affect clinical performance. Let's start with the two most overused letters in the nursing profession today. They are "N" and "L." Put together they read "NL" which stands for "No Lunch." Nurses often complain that they cannot get lunch because they are so busy. Many times this is absolutely true and regrettable. The culture has responded to this problem by offering compensation when meals are missed. Rather than fix the core issue, we allow nursing staff to write "NL" in a pay exception log; nurses may not eat, but they will get paid. For some nurses this insidiously becomes a part of their financial planning as they realize the boost that these two initials can give their paycheck. The human body needs fuel to maintain acceptable blood glucose levels and to nourish organs and tissues properly, most importantly the brain. Yet in professional nursing today, we expect practitioners to make accurate clinical decisions under great pressures, while at the same time going long hours without a proper meal, enjoyed without interruption.

Fatigue

The research on the negative effects of fatigue on motor and cognitive performance is well documented. As discussed, there is regulatory protection in aviation that sets a standard for pilot duty time and rest requirements. In nursing, such protections are not uniformly present, leaving fatigue and rest guidelines up to individual healthcare organizations. These guidelines can be liberal and are often pushed to the limit or creatively ignored to relieve staffing pressures.

Nursing shift patterns tell the story with multiple 12-hour shifts scheduled in a row. The problem here is that multiple 12-hour shifts can lead to chronic fatigue and sleep debt if restful sleep is not obtained between duty periods. During a day in which nurses complete 12-hour shifts, they may actually be awake for as much as 17 hours, assuming they gets up at 5 a.m. and go to bed by 10 p.m. Even in the best scenario in which restful sleep is obtained for the seven full hours remaining before it is time to get up and do it all over again,

this routine can be cumulatively exhausting. It is difficult to believe that at 5 p.m. on the third 12-hour day shift in a row, nurses can safely handle the enormous workload and cognitive challenges existing on today's multibed medical surgical units.

Work factors arguing against 12-hour shifts include:

- Heavy physical work

- Demanding, repetitive mental work

- Safety-sensitive work

- Work requiring vigilance[16]

If this is not the quintessential description of nursing, then I don't know what is. If you understand the nursing culture, you know that 12-hour shifts are embraced by many within it. Twelve-hour shifts provide the opportunity to achieve concentrated work schedules and additional time off within the work week. For a workforce that consists of a large proportion of working mothers and many single working mothers bearing the dual responsibility of breadwinner and parent, this scheduling option can be attractive. When you add to this the existence of double shifts (16 hrs), which sometimes occur back to back, double backs (working until 11 p.m. and returning at 6:45 a.m. the next day), excessive amounts of available overtime, coupled with nurse managers desperate to fill staffing holes day to day, the conditions for the perfect storm to create a fatigued workforce are in place.

Task load

Pilots must multitask. There can be times in the cockpit when things get dicey and task load gets to a saturation point. Undoubtedly, pilots in this situation will miss something or not respond appropriately as the amount of stimuli exceeds the brain's capacity to process. It is, of course, advantageous to have another crew member backing you up so that safety critical items are not overlooked. In medical surgical nursing, task saturation occurs all too frequently,

which is a great source of error and frustration. ◆ For example, typical medical surgical nurses may have the following occur on the average day within a 30–60 minute period:

- A physician at the nurse's station wants to talk about a patient's vital signs

- A patient requests IV pain medication

- They begin administering routine morning medications to all seven of their patients

- A patient is awaiting discharge teaching

- A new admission has just arrived on the floor and needs to be clinically assessed and processed

- An IV infusion pump alarm is sounding

- A patient calls to complain that his or her IV is leaking at the insertion site

- A patient needs to be sent to surgery

◆ Sidebar 1.5

The myth of multitasking

The shorthand used for the human attempt to simultaneously do as many things as possible, as quickly as possible, preferably marshaling the power of as many technologies as possible, is multitasking.[17] Although we may consider ourselves experts in crowding, pressing, packing, and overlapping distinct activities into all-too-finite moments, according to researcher James Poldrack, "We're really built to focus. And when we sort of force ourselves to multitask, we're driving ourselves to perhaps be less efficient in the long run even though it sometimes feels like we're being more efficient".[18, 19] In addition, we can easily become so preoccupied with one task that monitoring of all other tasks is stopped. Even if monitoring does not drop out completely, the quality of monitoring suffers. Although the study of the cognitive processes involved when juggling several tasks concurrently is just beginning, it is known that multitasking is error prone.[20]

- The blood bank calls and says that the first unit of Packed Red Blood Cells (PRBC) to be transfused for a patient is ready for pickup

- The case manager hands them a nursing home transfer form and wants them to fill in the patient's medications and latest vital signs

Clearly, this is a lot to manage in such a short time. I can see many medical surgical nurses reading this and nodding their heads up and down saying, "Yep, that sounds like a routine day for me." The existing professional culture allows the placement of nurses in situations in which the requirement to multitask reaches unmanageable levels, and at the same time demands precision and success. How can we realistically talk about patient safety when task saturation is the order of the day? Unlike pilots in the cockpit, when nurses endure task saturation, there is often no one to back them up to make sure critical things are not overlooked.

Nonnursing functions

Put simply, nurses are often expected to complete nonclinical, nonnursing functions. Let me say it this way: When I was flying in an airliner, never did anyone say to me, "Look guys, today we are short a flight attendant. What I need you to do is when you level off at 35,000 feet, unbuckle you safety harness, walk to the back, and help serve peanuts and ginger ale." It is absurd to even consider such a request. I argue that passengers would start squirming in their seats if such a thing actually happened. They would think, "Isn't he supposed to be flying the airplane?" Yet, in professional nursing, when the transport department is short of personnel, or the pharmacy does not have enough technicians to run missing drugs to the units, nurses are often expected and required to take on these tasks. The expectation to complete nonnursing functions adds to task saturation, interrupts nursing thought work, and places the patient at risk. We would never expect pilots to sacrifice concentration for the completion of tasks outside the scope of their number one job, which is to fly the airplane. For nurses, their number one job is to assess patients using specialized knowledge and critically think as they expertly manage clinical problems. It therefore seems culturally deficient to allow or require nurses to be pulled off task to complete nonskilled, nonclinical tasks.

Distractions

Earlier we discussed the term "critical flight regime" to describe periods in the cockpit where task load is high and interruptions pose a serious threat to safety. What would be considered a "critical flight regime" for nurses regardless of clinical specialty? Medication administration rapidly comes to mind although there are many others. On the multibed medical

surgical unit, nurses spend a significant amount of time engaged in this activity. It is a task that requires thought work and concentration, and it is reasonable for a patient to expect that the completion of this task will not harm them. Yet, medication administration, this "critical regime," is often carried out in an environment replete with noise, distractions, false starts, and interruptions. ◆

> ◆ Sidebar 1.6
> ### Task interruptions and inadvertent omissions
>
> In *The Principles of Psychiatry*, William James has praised the "the faculty of voluntarily bringing back a wandering attention, over and over again" as the very root of judgment, character, and will. However, in the high-stakes environment of the nursing unit, interruptions, distractions, and unexpected task demands, which impair both individual and team performance, are the norm.[21] Interruptions challenge the cognitive mechanism by which individuals remember to perform intended actions and remember to perform a deferred task. Without an explicit prompt that the time has come to act, it is all too easy to forget.[20] Thus, inadvertent omissions have been shown to constitute the largest class of human performance problems in numerous hazardous operations.[22]

Task completion and focus become difficult as nurses start and stop over and over again. In a sense, the long-standing paradigm in the culture has been that nurses are open season for anyone traversing the unit environment. A few years ago, as a nurse manager on a large medical surgical unit, I, along with an outstanding nursing staff, implemented a CRM-based care delivery model, part of which included mechanisms to reduce distractions modeled after the "sterile cockpit" concept in aviation. A detailed discussion of this implementation, cultural reactions, and relevant literature can be found in Chapter 6.

Standardization

We talked briefly about standardization in the airline culture. In the cockpit, standardization provides a frame of reference, serves to mitigate the unexpected, and allows us to predict behavior in both routine and emergent circumstances. For nurses, it serves the same purpose; however, the clinical environment often falls short in securing adequate levels of standardization. The nursing culture has traditionally been programmed to accommodate varying preferences and idiosyncrasies of physician providers.[15] For example, there are facility-based

protocols regarding heparin, sliding scale insulin, and postoperative analgesia, yet some physicians choose to use variations of these protocols based on individual preference. In such cases, nurses are burdened with having to keep tabs on an array of preferences rather than a single standard. This is not optimal from an error avoidance standpoint.

Equipment may differ as well. Defibrillators and hospital beds can vary from unit to unit within the same facility. Vendors can change causing unanticipated changes in syringes and drug packaging. Differences in patient care processes among units can also be commonplace. While some nursing units may be standardized in their processes, their "standards" are not uniform throughout a facility. The result is pockets of differing standardization creating vulnerabilities when nurses are floated (reassigned) from their home unit to unfamiliar clinical areas. Processes that are not standardized institutionally place patients at risk. The case below illustrates this point:

On 9 North, a medical-surgical unit, the computer generated medication adminis-tration record (MAR) schedules a.m. insulin to be given at 0700, which appears in the day shift section of the MAR. Although the day shift technically begins at 0700, day shift nurses are in report and not available to administer insulin. On 9 North, breakfast trays usually arrive right at 0700 as well. Because of this, the unit has decided that the night nurse will administer the insulin prior to 0700 and document on the night shift section of the record.

9 East is also a medical-surgical unit. On this unit, the day nurse administers all 0700 insulin, and it has been done this way for years. One night, a nurse from 9 North is floated to 9 East to help with short staffing. Prior to 0700, the nurse administers the 0700 insulin as she does on her home unit. This is business as usual to her so she makes no mention of this routine activity when she reports to the day shift nurse. The day shift nurse on 9 East does not see the night shift documentation of the insulin that was given to the patient (there would be no reason for her to check this) and administers the a.m. insulin to the patient for the second time, documenting this act in the 0700 block of the MAR. A few hours later, the patient becomes severely hypoglycemic.

Recurrent training and performance checking

When I speak to groups of nurses, I usually ask three questions about recurrent training:

Question 1: Who has practiced in this particular organization for more than 10 years?

Several hands go up.

Question 2: For those that raised their hand, did you attend new employee orientation when you were hired 10 years ago?

Same number of hands goes up.

Question 3: For those that raised their hand, how many have gone back through orientation within those 10 years?

Not a single hand goes up.

It is conceivable that after initial new hire orientation is complete, a nurse will never again return to the classroom setting for a review of basic policy and procedure. They do complete yearly competency or skills check offs, but these are often more of a formality and can be haphazard. Often nurses must complete such check offs on their own time (above and beyond their work schedule), or are expected to squeeze the review into their workday while they are on the unit caring for patients. Usually, this means they will run down to the skills area and move rapidly through multiple stations, completing the yearly requirement in minimum time. Stations are designed for ease of flow rather than detailed practice and challenge. It is not a test of knowledge, but a fulfilling of a requirement: a check off. Completely removing nurses from their clinical duties and sending them to a comfortable

learning environment for training and practice, then thoroughly checking performance using high-fidelity simulation is not common practice in the culture. This topic will be outlined further in Chapter 9.

Conclusion

Now the blank page is filled and the culture comparison—aviation on one side and nursing on the other—is complete. I have outlined many areas where professional nursing, in terms of practice and leadership, has much work to do if it is to truly become a culture of safety. Caring and human empathy as a specialty set nursing apart from other disciplines in healthcare. This should never be overlooked or lost in any effort to transform the culture. With that said, I steadfastly maintain that the concepts, tools, and practices that define CRM, practices used in cockpits all over the world, provide a sound model for cultural change in professional nursing.

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