Forty Years of Hot Tub Therapy...

Dr Matthew J W Thomas - PACDEFF 2017

CQUniversity Australia

Westwood-Thomas Associates.

Westwood-Thomas Associates.

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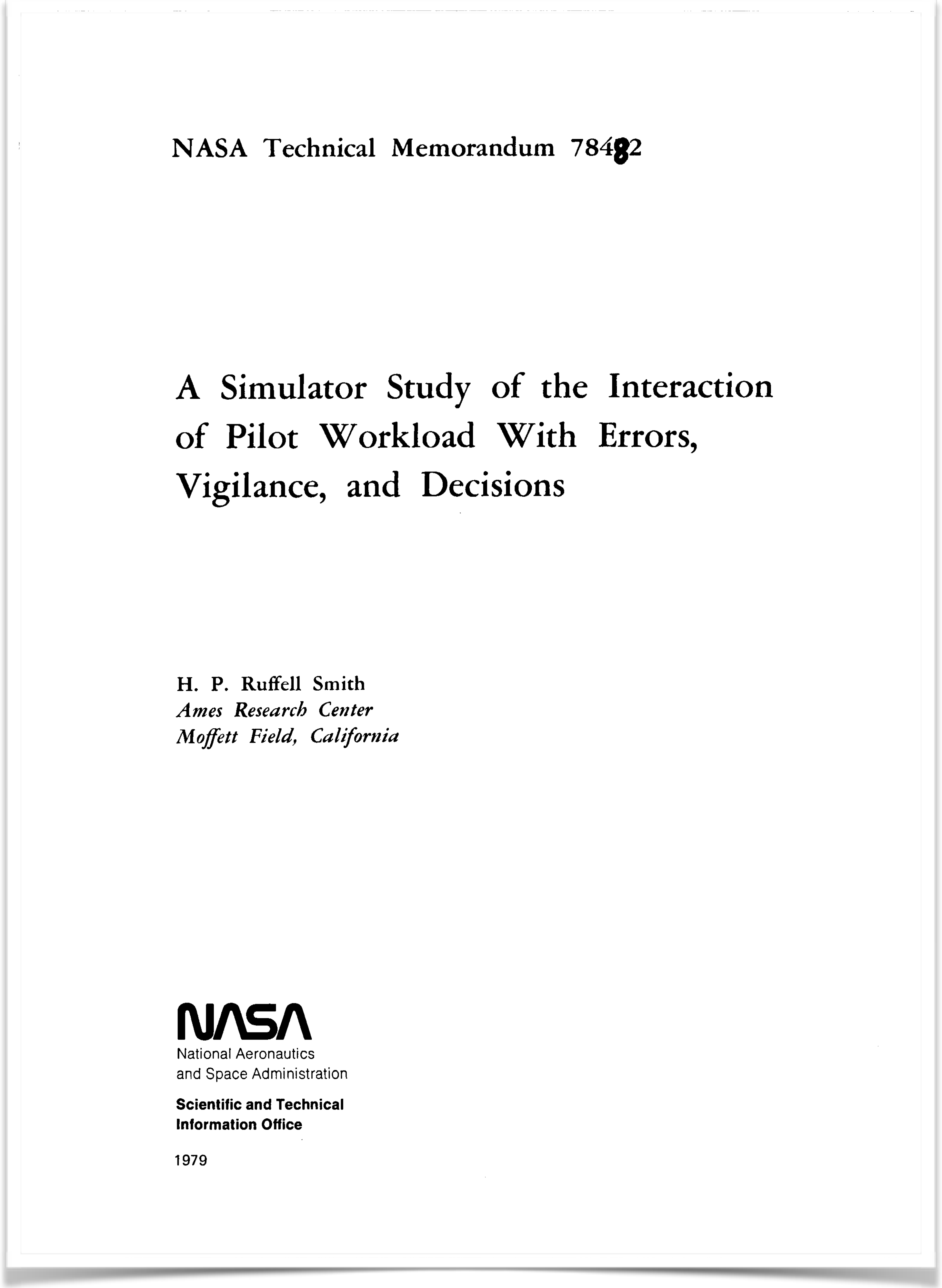
Presentation Overview

- Rub a dub dub - into the tub!
- Sharing the love - a systematic review
- The future is bright…

Into the hot tub...


Captain Hugh Hefner
Founder of CRM
http://www.esquire.com/news-politics/a20903/hugh-hefner-interview-0413/
Peter Yang


NASA Technical Memorandum 78482

A Simulator Study of the Interaction of Pilot Workload With Errors, Vigilance, and Decisions

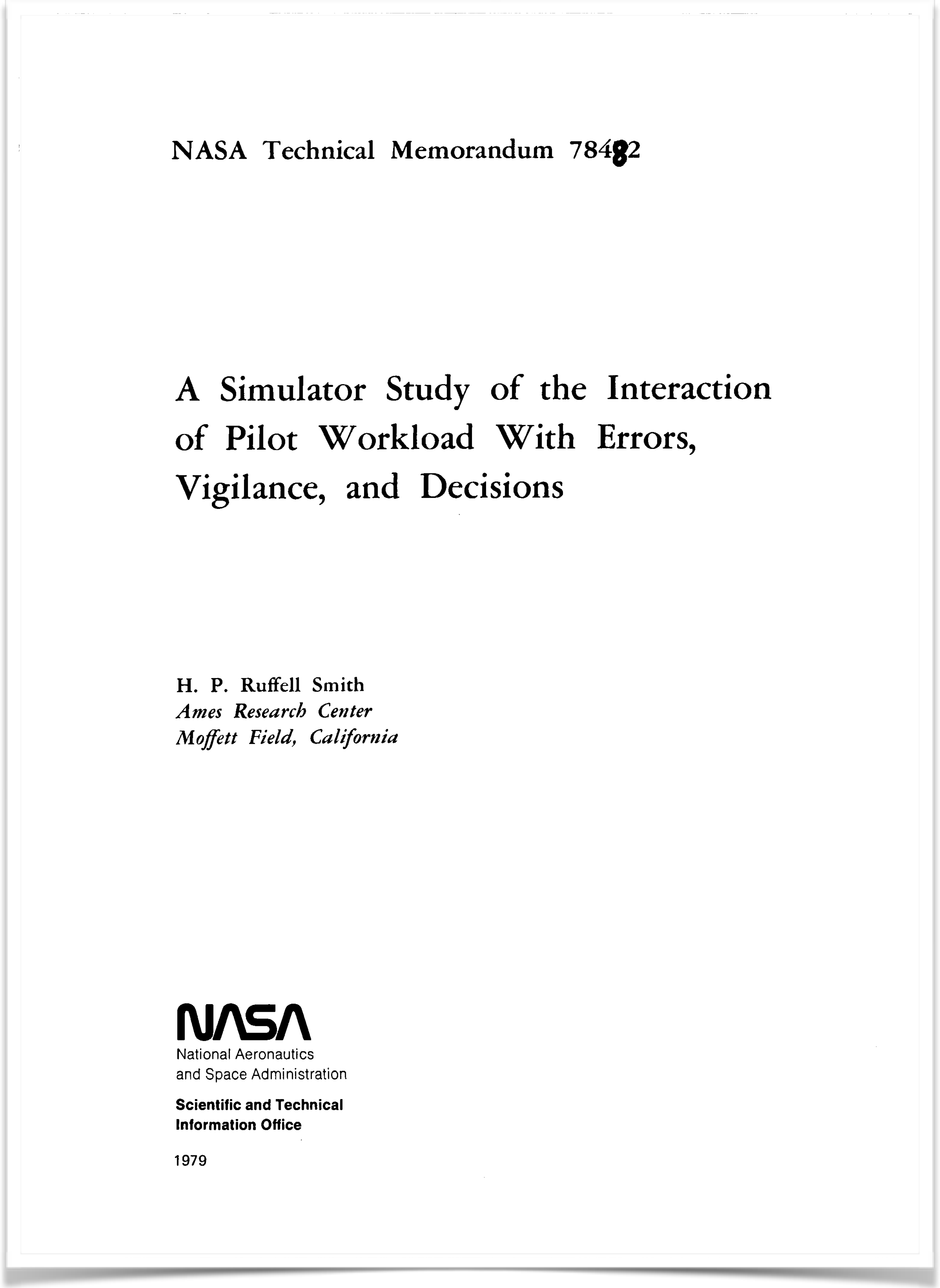
H. P. Ruffell Smith
Ames Research Center
Moffett Field, California

NASA
National Aeronautics and Space Administration

Scientific and Technical Information Office

1979

This whole mess started with science...



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CONCLUSIONS AND RECOMMENDATIONS

The results indicate that high workload can lead to decreased performance of flight crews. This decrease is manifested by errors in the operation of systems and mistakes in navigation that are associated with prolonged response times to aircraft abnormalities.

Some of the difficulties are induced by deficiencies i.n the design of flight decks and instrumentation, others by those of documents and charts.

Many of the problems, however, relate to the management of human and mechanical resources. The variability between crews in reacting to the same problems suggests that those who perform less well might be helped by special training.

Consequently, it is recommended…***that special training in resource management and captaincy be developed and validated.*** Such training should include the use of full mission simulation of scenarios that are representative of actual situations. Special emphasis should be given to those situations where rapid decisions and safe solutions for operating problems are required.

NASA Conference Publication 2120

Resource Management on the Flight Deck

Proceedings of a NASA/Industry Workshop
Held at
San Francisco, California
June 26-28, 1979

Edited by
George E. Cooper
Maurice D. White, G. E. Cooper Associates, Saratoga, California
John K. Lauber, Ames Research Center, Moffett Field, California

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035

NASA Workshop

1979

The New York Times

April 1, 1987

AIRLINES STRESS TEAMWORK IN COCKPIT

By ERIC SCHMITT, Special to the New York Times

DENVER— On a recent United Airlines flight from Reno to San Francisco a bomb exploded in the luggage hold.

The captain and two flight officers, who had never flown together before, quickly steered the plane to a lower altitude, determined that there were no injuries or serious structural damage, conferred with the authorities on the ground and debated whether to make an emergency landing and evacuation.

The plane landed safely, here at United's flight training center. The emergency unfolded in a flight simulator where the crew's performance was videotaped. The pilots later watched the tape and evaluated their teamwork.

Airlines have always tested pilots to keep their flying skills sharp. But United and a growing number of other carriers are now putting more emphasis on how well cockpit crews work together as a team, particularly in emergencies.

From 60 to 70 percent of all commercial airliner crashes result from pilot error, according to the National Transportation Safety Board. Human failings are the most frequent cause of accidents, ahead of aircraft, weather and maintenance problems. More Assertiveness Urged

Airlines are training captains to manage their crews more effectively and urging flight officers to be more assertive in challenging captains and air traffic controllers when they detect a problem. Borrowing from business management, the carriers are stressing leadership, decision-making, coordinated planning and frank communication among crew members.

"As planes become more and more reliable, we need to train airmen on the human resources available to them," said Capt. Lawrence N. Brown, head of the Pan American World Airways flight academy in Miami.

Too often, aviation safety experts say, a relatively small mechanical malfunction that by itself would not cause a crash sets in motion a chain of human errors that culminates in catastrophe.

A United DC-8 ran out of fuel and crashed six miles from the Portland, Ore., airport in December 1978, killing eight passengers and two crew members. Investigators ruled that the pilot became

1st April 1987

Advocates of such training have struggled to win over a skeptical pilot corps. "***The initial suspicion among pilots was that it was some kind of charm school; that you had it in a hot tub holding hands***," said Robert L. Helmreich, a psychology professor at the University of Texas who is working on a grant from NASA to study the effects of cockpit resource management.

NASA Conference Publication 2455

Cockpit Resource Management Training

Edited by
Harry W. Orlady
Orlady Associates, Inc.
Los Gatos, California

H. Clayton Foushee
NASA Ames Research Center
Moffett Field, California

Proceedings of a workshop
sponsored by NASA Ames Research Center
and the U.S. Air Force Military Airlift
Command and held in
San Francisco, California
May 6–8, 1986

NASA
National Aeronautics
and Space Administration

Scientific and Technical
Information Branch

1987

NASA Workshop

1986

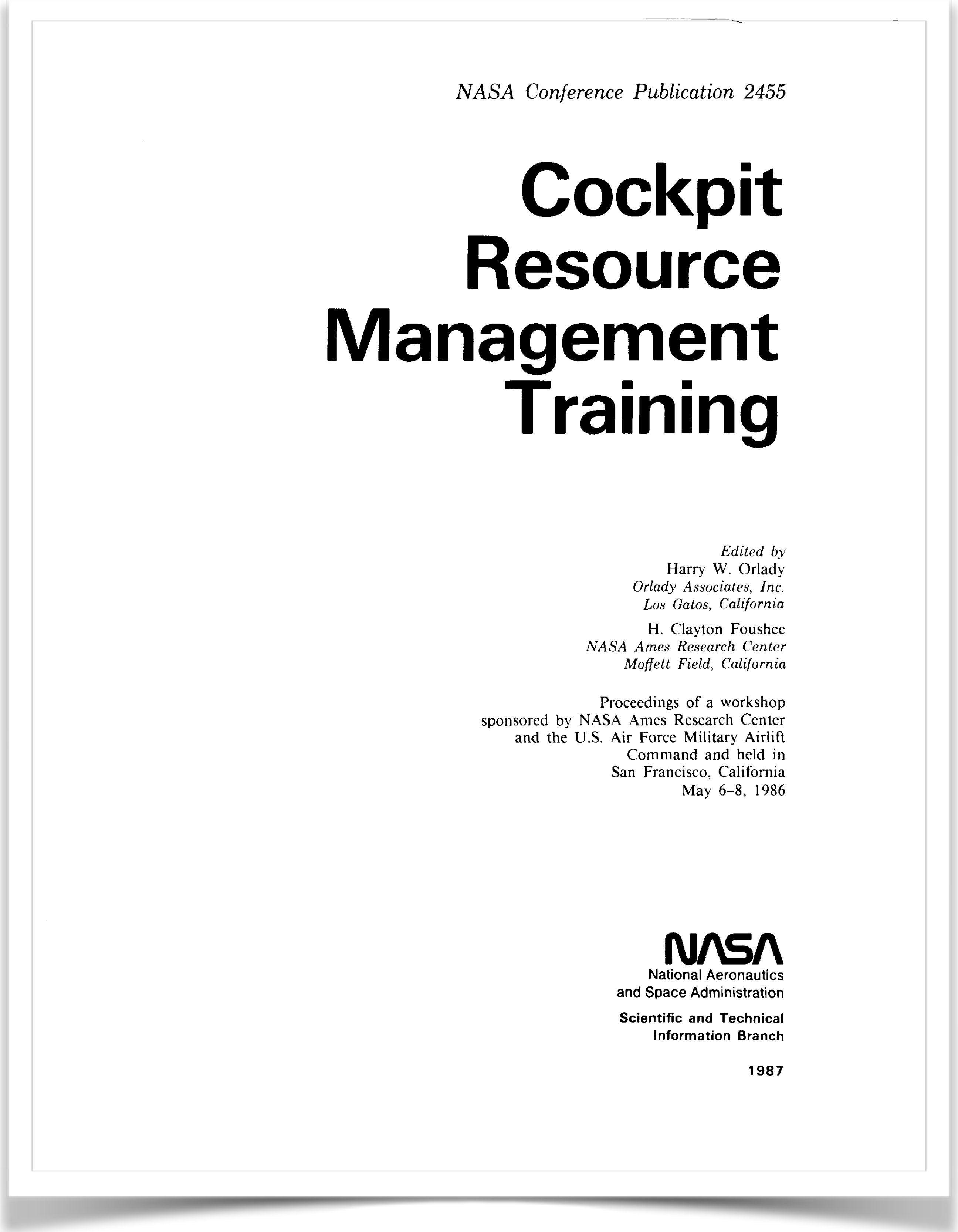
The trainee needs to be personally involved and actively participating in the process.

The classic lecture / text instructional format does not provide the involvement and personal learning necessary to effect real change.

In this context, LOFT with videotape feedback is one of the most powerful tools we have. I am convinced that CRM training without the chance for practice and self-observation that comes with LOFT will be relatively ineffective

Prof Bob Helmreich

1986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NASA
National Aeronautics and Space Administration
Scientific and Technical Information Branch

1987

Capt. David H. Shroyer

United Airlines

Capt. J. E. Carroll

The CRM Company

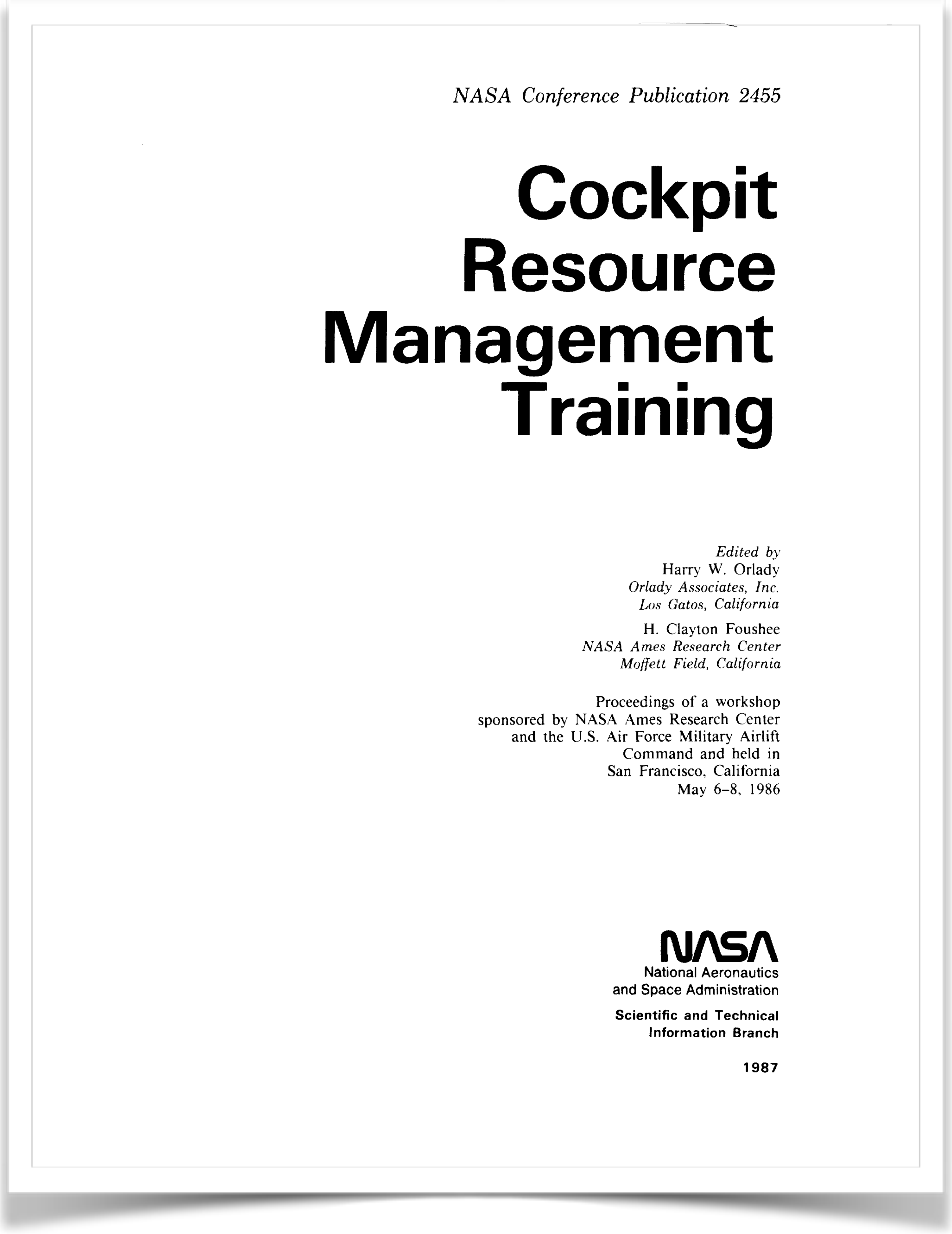
Dr. William R. Taggart

The CRM Company

The self-study program and seminar make an indispensable contribution to better teamwork, but they can only be a part of the training if there is to be the hoped-for application in the flight environment. They do, however, provide a very strong foundation upon which to build for future operational effectiveness.

A line-oriented flight training (LOFT) exercise is then conducted in the flight simulator where all crewmembers have an opportunity, in their own crew position and in a familiar environment, to practice the principles previously instilled. Two flights are flown by each crew and recorded on videotape. At the conclusion of the exercise, the videotape is reviewed by the crew, solely for the training value that can be achieved.

This fosters the recognition among crewmembers that the approach is one of enhancing their professional abilities. As a result, the response of the crews to the training is very positive.



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The CRM Company

UAL Recurrent Training Outline

Day-One: CRM & EPs

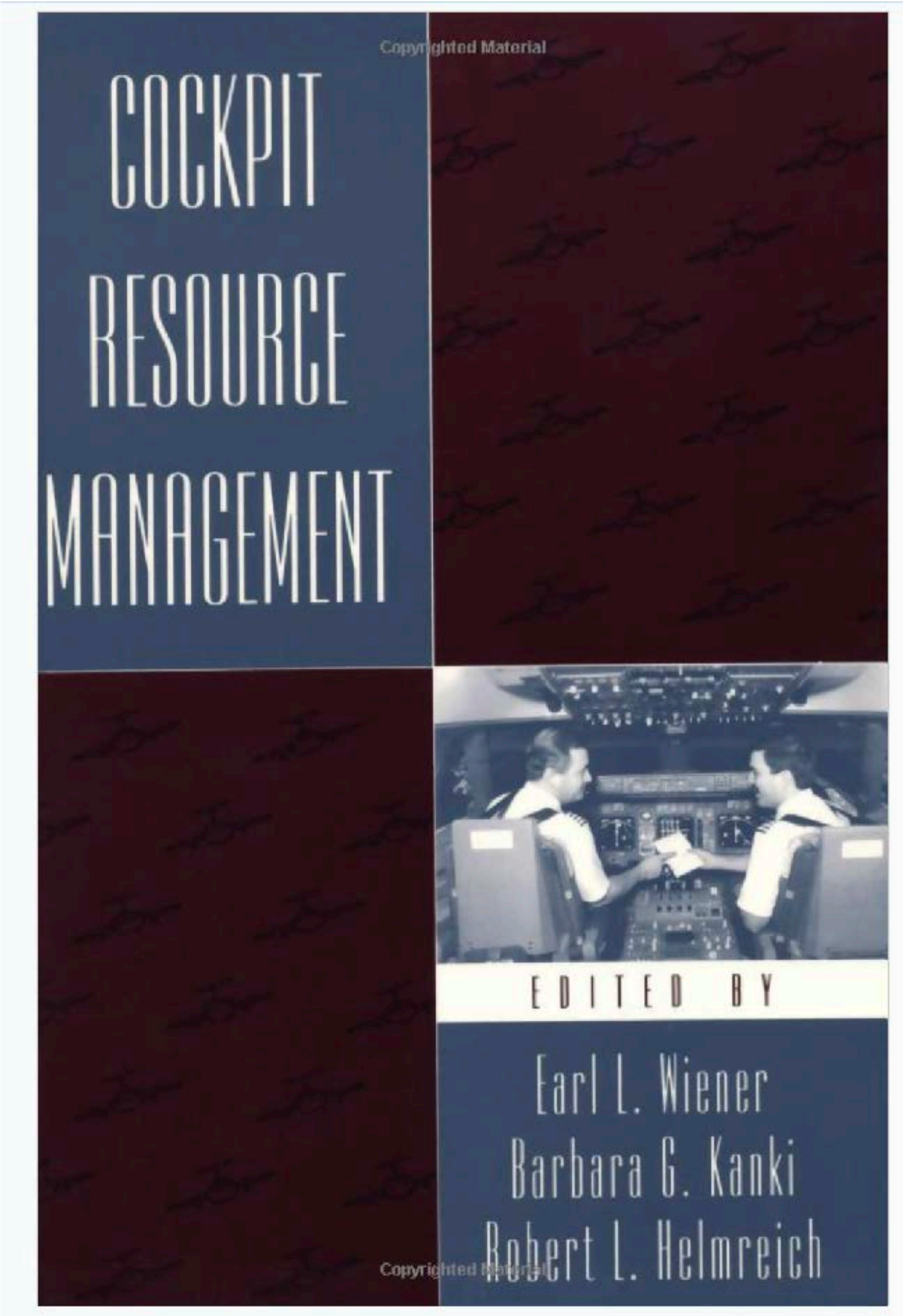
A) CRM exercise
B) Systems and operational review
C) Evacuation training (refresher)
D) Rules of LOFT

Day-Two—LOFT

A) Pre-flight for S/O or crew for 2-man aircraft.
B) Flight planning
C) LOFT (one or two segments)
D) Proficiency check maneuvers practice
E) Critique (video tape)

Day-Three--Proficiency Check:

A) Oral
B) Simulator check
C) Special training (wind shear, required items, etc.)
D) Operational review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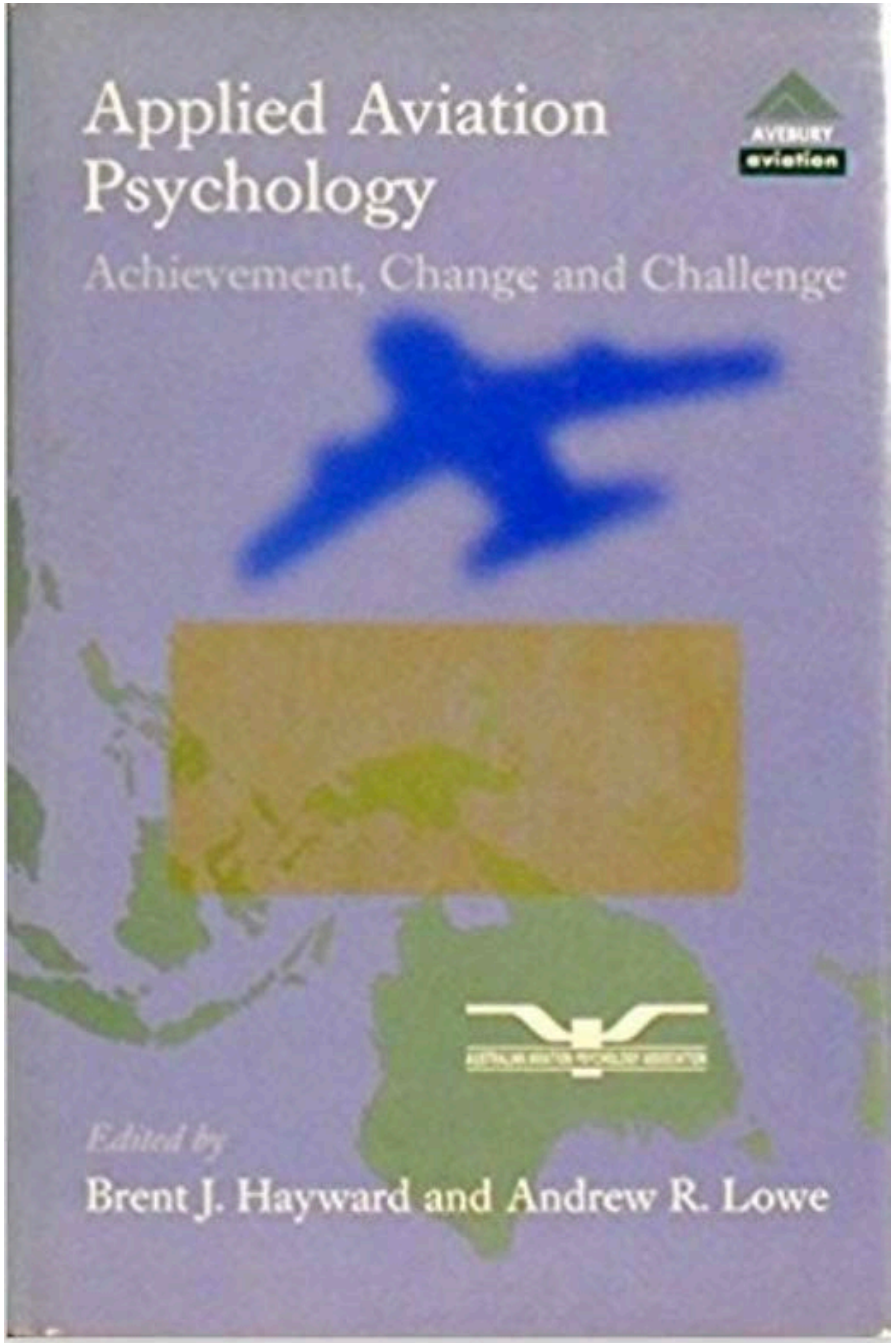
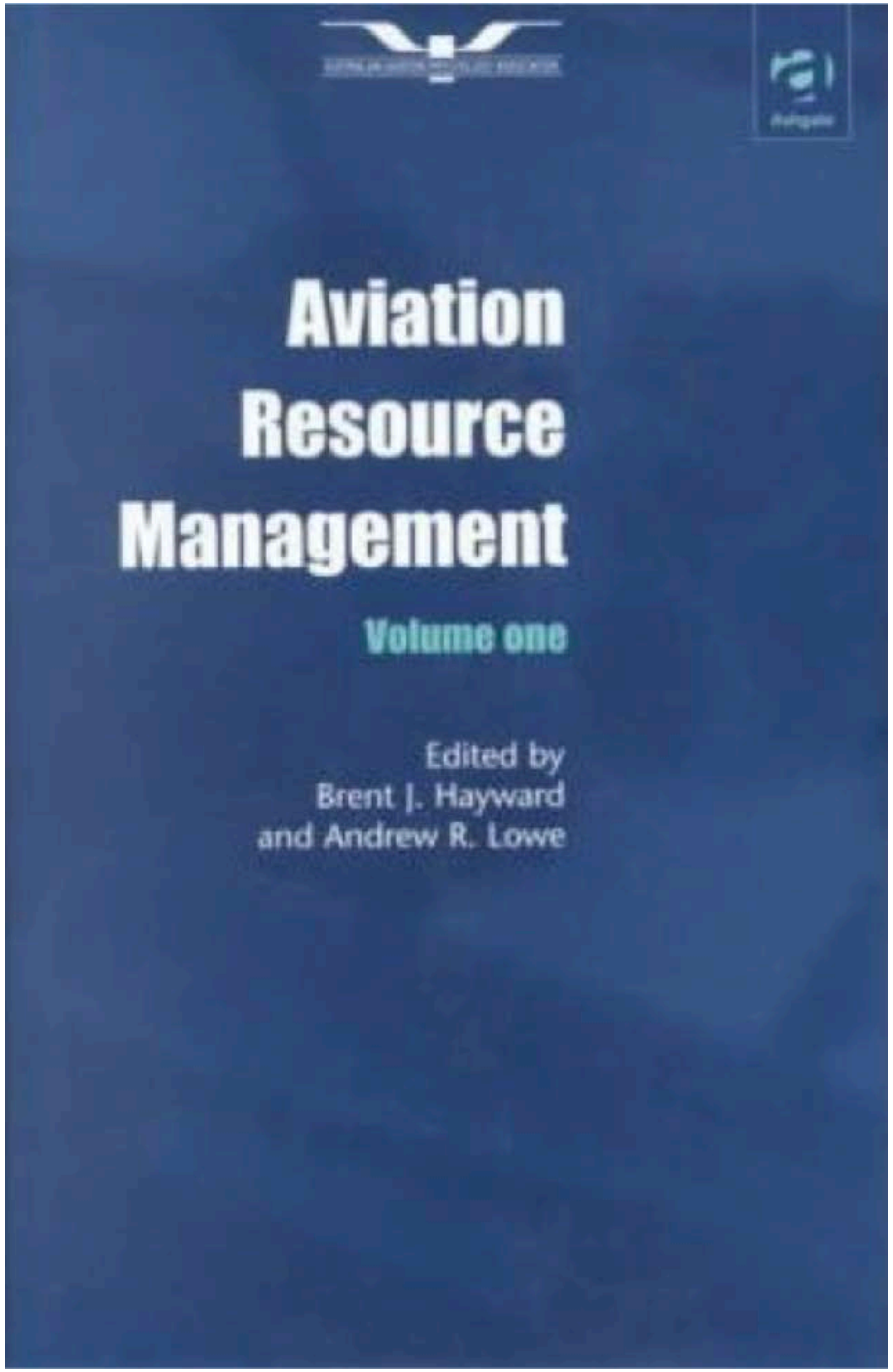
1993



AAvPA Manly – 1995

AAvPA Manly - 1998



Jump in – the water's hot!

Sharing the love...

Systematic Review Methodology

Systematic reviews seek to collect all evidence that fits pre-specified eligibility criteria. They provide a reliable synthesis of all evidence on a given topic.

Higgins, J. P. T., & Green, S. (Eds.). (2008). *Cochrane Handbook for Systematic Reviews of Interventions*. Hoboken, NJ: Wiley-Blackwell.

Systematic Review Methodology

Objectives

- To quantify the number of studies on CRM/NTS published in the scientific peer reviewed literature
- To classify the types of CRM/NTS training interventions
- To evaluate the effectiveness of CRM/NTS training with respect to safety performance metrics

Systematic Review Methodology

Participants

- Commercial aviation workforce

Interventions

- Any form of CRM / NTS training

Comparisons

- Training delivery mode
- Target groups (flight crew, cabin crew, maintenance engineers)
- Training assessment

Outcomes

- Training effectiveness

Systematic Review Methodology

Title, Abstract or Keywords contains:

- Crew Resource Management; or
- Non-Technical Skills; or
- Team Training; or
- Error Management.

Publication Date

- 2000 - present

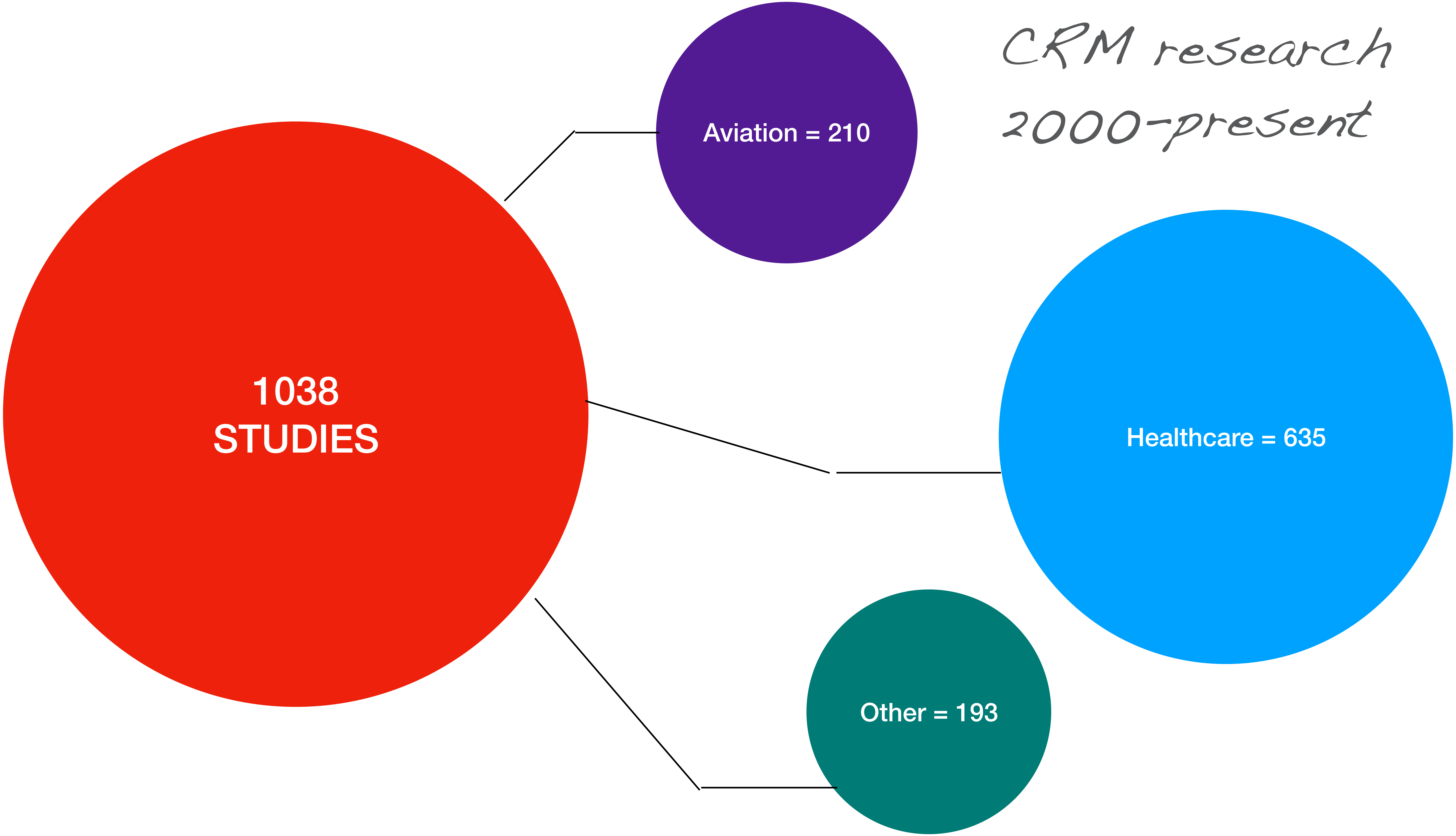
Any field contains

- Airline; or
- Aviation

((TITLE-ABS-KEY ("non-technical skills") OR TITLE-ABS-KEY ("error management") OR TITLE-ABS-KEY ("team training") OR TITLE-ABS-KEY (“crew resource management")) AND PUBYEAR > 1999) AND ("airline" OR "aviation")

CRM research
2000-present

1038
STUDIES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2000-present
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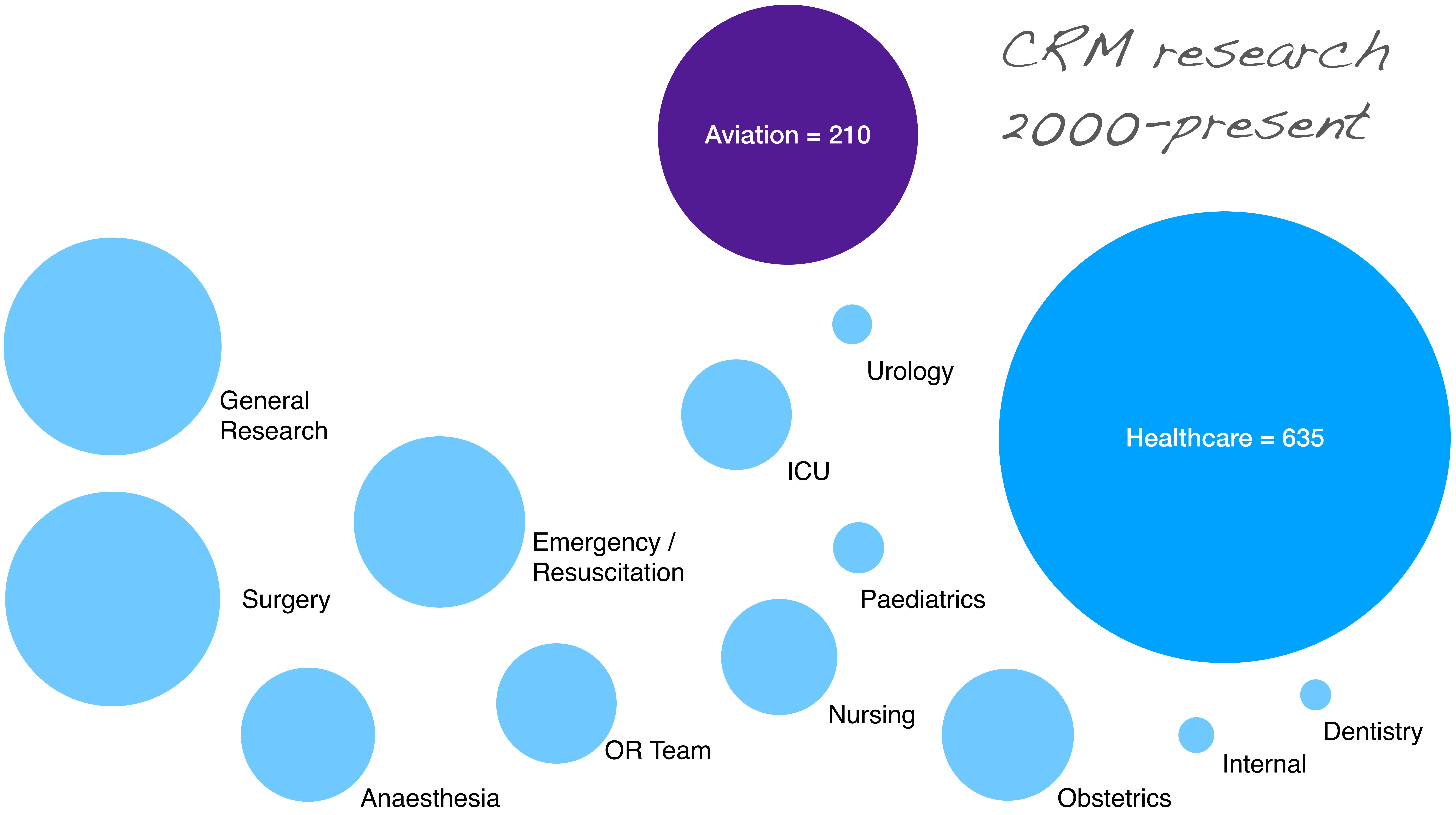
STUDIES
Healthcare = 635
Other = 193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Obstetrics
Internal
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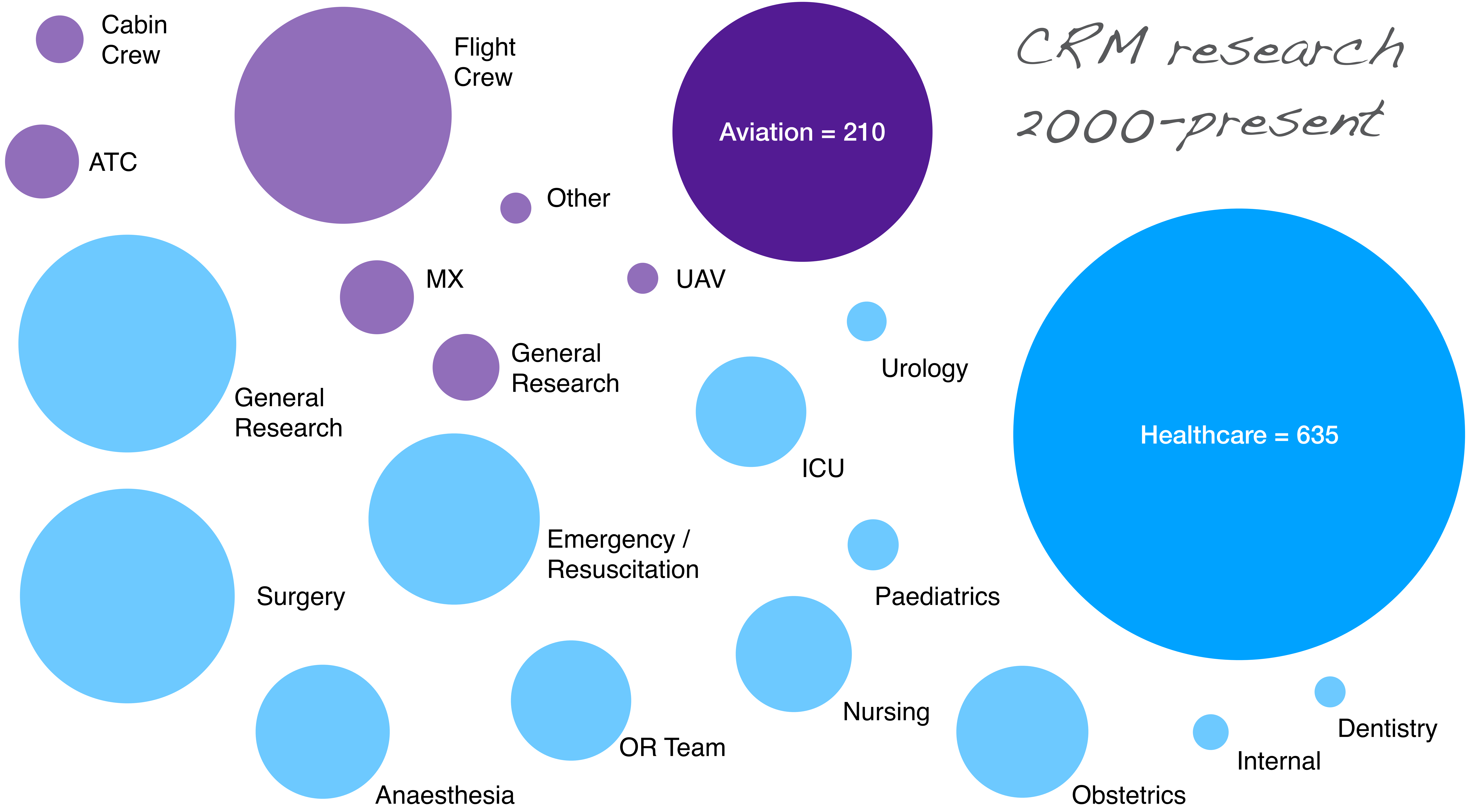
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ATC
Other
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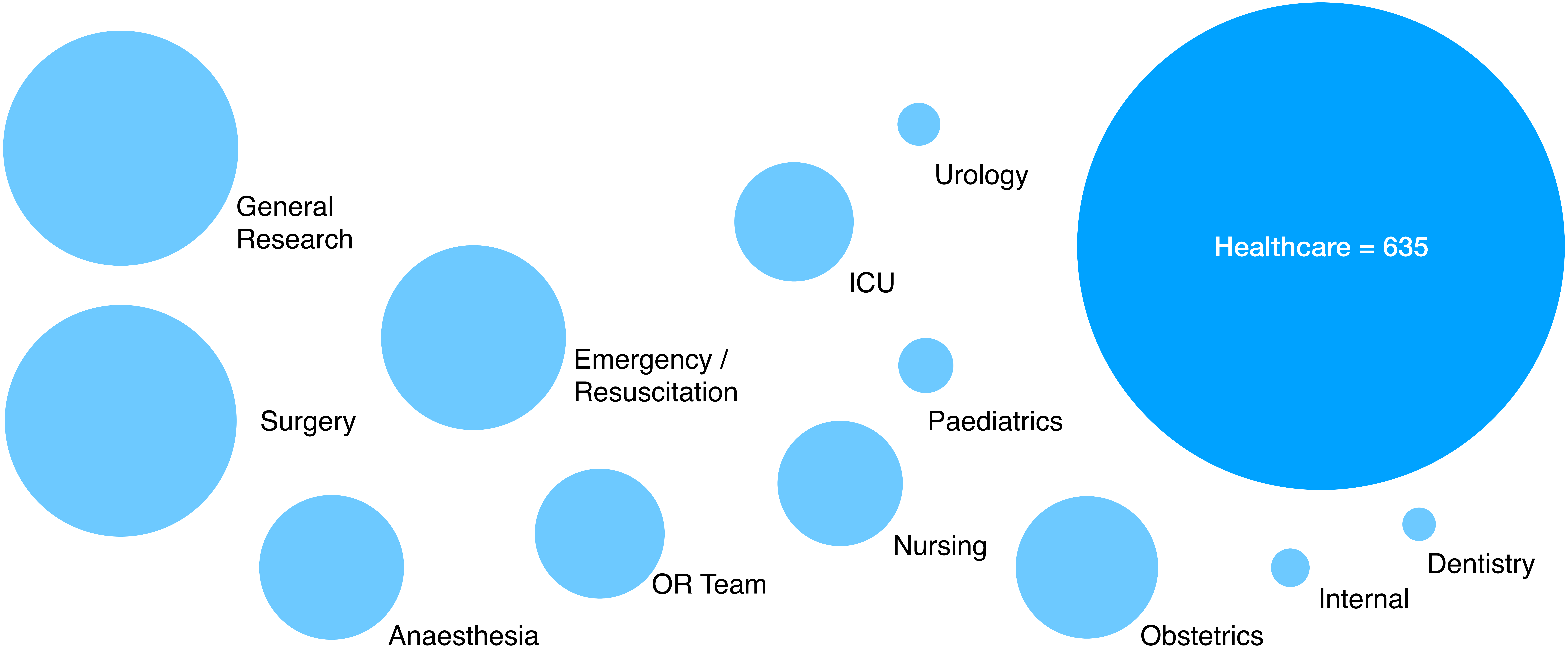
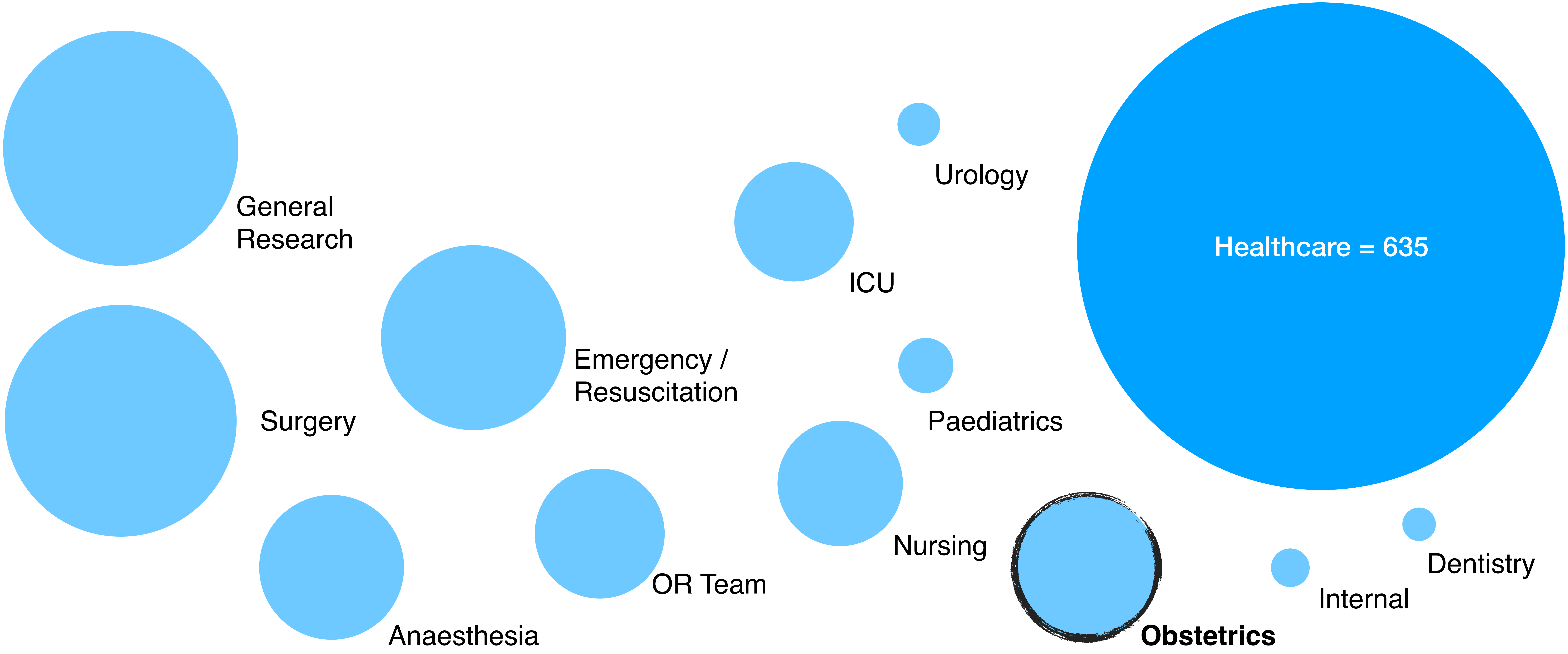
UAV
General Research
Urology
General Research
ICU
Healthcare = 635
Emergency / Resuscitation
Surgery
Paediatrics
Nursing
OR Team
Dentistry
Anaesthesia
Internal
Obstetrics

CRM research 2000-present



CRM research 2000-present



Lessons from the cockpit: How team training can reduce errors on L&D

By Susan Mann, MD, Ronald Marcus, MD, and Benjamin Sachs, MB, BS

Although many ob/gyns believe they already work on an interdisciplinary team, most don't really apply the principles of teamwork on labor and delivery. This Harvard team has discovered that applying the concepts used by military and commercial flight teams—an approach called Crew Resource Management—can improve patient safety and reduce the epidemic of lawsuits plaguing the specialty.

Preventable medical errors account for more deaths each year than breast cancer, automobile accidents, or drownings. Poor communication among health-care workers is the most common cause of these errors.[1,2] This state of affairs is due in part to the fact that patient care is still provided by clinicians who are compartmentalized into separate disciplines, the so-called "silo approach" to health care. Changing this culture is going to require team training across disciplines, encompassing obstetricians, midwives, nurses, and anesthesia providers. And while this approach may meet some resistance, we're convinced by the data—and our own clinical experience—that it will provide a safety net that helps reduce preventable errors and medical malpractice suits.

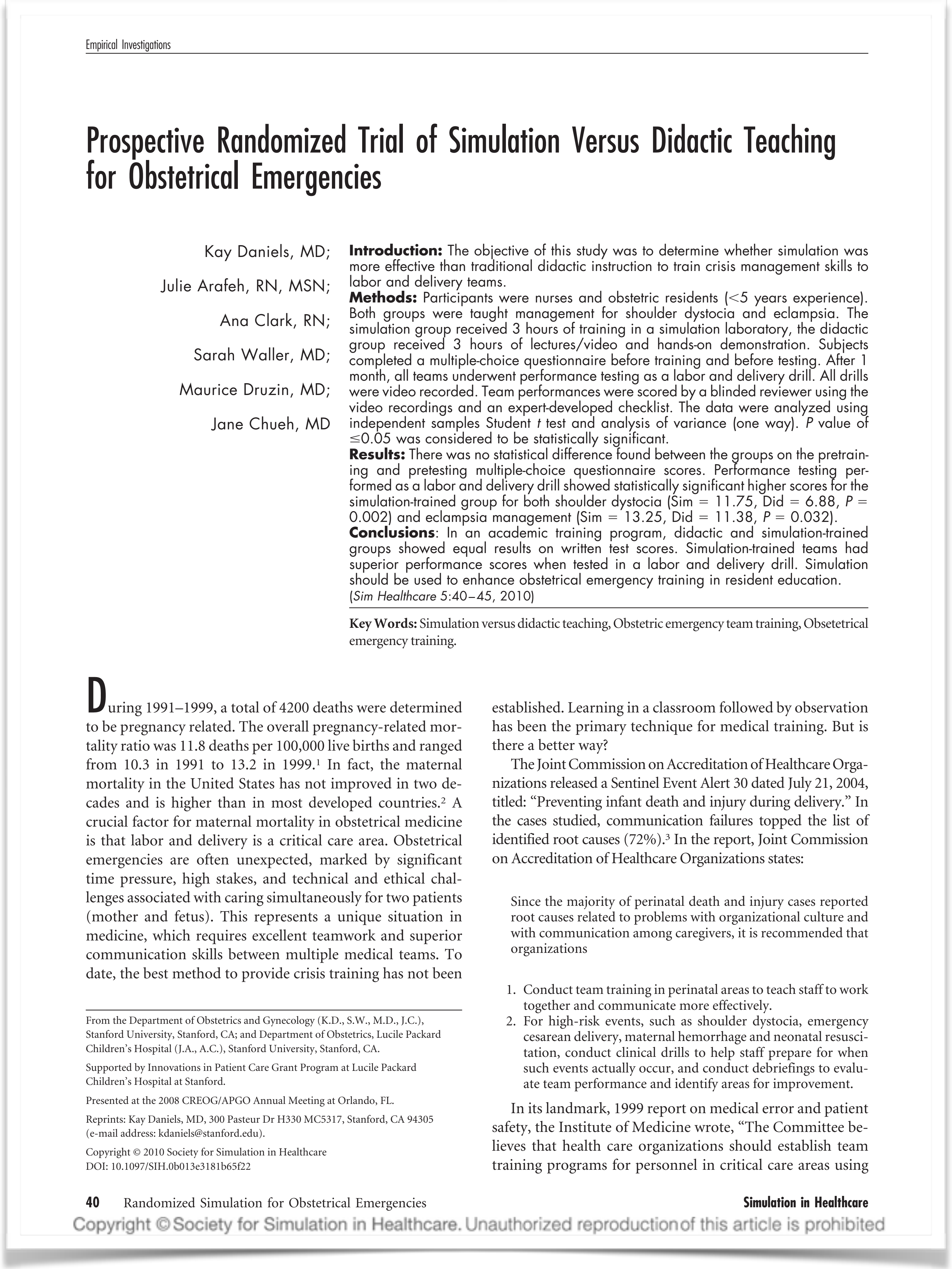
DR. MANN and DR. MARCUS are Assistant Professors of Obstetrics, Gynecology, and Reproductive Biology, Harvard Medical School and Beth Israel Deaconess Medical Center in Boston, Mass.

DR. SACHS is Chief of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center; Harold H. Rosenfield Professor of Obstetrics, Gynecology, and Reproductive Biology, Harvard Medical School; and Professor in the Department of Society, Human Development, and Health, Harvard School of Public Health, Boston, Mass.

The impact of preventable medical errors was recognized by the Institute of Medicine in its 1999 landmark report on patient safety, *To Err is Human*, which estimated that 45,000 to 98,000 Americans die annually and cost the nation about $29 billion.[3] What many critics forget, however, is that these errors are often made by highly skilled professionals and are generally the result of system failures, not substandard individual performance. Unfortunately, despite our best intentions, errors occur, patients die, and the clinicians involved often become the "secondary victim."[4]

Currently, in most labor and delivery units, patient information is not shared in a coordinated way between providers. When there's a shift change, for instance, nurses sign out to nurses, obstetricians hand off patients to obstetricians—often by phone or e-mail—residents attend teaching rounds, and rarely are anesthesiologists and neonatologists included in any sign-out of important information regarding OB

Jay Montgomery



Empirical Investigations

Prospective Randomized Trial of Simulation Versus Didactic Teaching for Obstetrical Emergencies

Kay Daniels, MD; Julie Arafeh, RN, MSN; Ana Clark, RN; Sarah Waller, MD; Maurice Druzin, MD; Jane Chueh, MD

Introduction: The objective of this study was to determine whether simulation was more effective than traditional didactic instruction to train crisis management skills to labor and delivery teams.
Methods: Participants were nurses and obstetric residents (<5 years experience). Both groups were taught management for shoulder dystocia and eclampsia. The simulation group received 3 hours of training in a simulation laboratory, the didactic group received 3 hours of lectures/video and hands-on demonstration. Subjects completed a multiple-choice questionnaire before training and before testing. After 1 month, all teams underwent performance testing as a labor and delivery drill. All drills were video recorded. Team performances were scored by a blinded reviewer using the video recordings and an expert-developed checklist. The data were analyzed using independent samples Student *t* test and analysis of variance (one way). *P* value of ≤0.05 was considered to be statistically significant.
Results: There was no statistical difference found between the groups on the pretraining and pretesting multiple-choice questionnaire scores. Performance testing performed as a labor and delivery drill showed statistically significant higher scores for the simulation-trained group for both shoulder dystocia (Sim = 11.75, Did = 6.88, *P* = 0.002) and eclampsia management (Sim = 13.25, Did = 11.38, *P* = 0.032).
Conclusions: In an academic training program, didactic and simulation-trained groups showed equal results on written test scores. Simulation-trained teams had superior performance scores when tested in a labor and delivery drill. Simulation should be used to enhance obstetrical emergency training in resident education.
(*Sim Healthcare* 5:40–45, 2010)

Key Words: Simulation versus didactic teaching, Obstetric emergency team training, Obsetetrical emergency training.

During 1991–1999, a total of 4200 deaths were determined to be pregnancy related. The overall pregnancy-related mortality ratio was 11.8 deaths per 100,000 live births and ranged from 10.3 in 1991 to 13.2 in 1999.[1] In fact, the maternal mortality in the United States has not improved in two decades and is higher than in most developed countries.[2] A crucial factor for maternal mortality in obstetrical medicine is that labor and delivery is a critical care area. Obstetrical emergencies are often unexpected, marked by significant time pressure, high stakes, and technical and ethical challenges associated with caring simultaneously for two patients (mother and fetus). This represents a unique situation in medicine, which requires excellent teamwork and superior communication skills between multiple medical teams. To date, the best method to provide crisis training has not been established. Learning in a classroom followed by observation has been the primary technique for medical training. But is there a better way?

The Joint Commission on Accreditation of Healthcare Organizations released a Sentinel Event Alert 30 dated July 21, 2004, titled: "Preventing infant death and injury during delivery." In the cases studied, communication failures topped the list of identified root causes (72%).[3] In the report, Joint Commission on Accreditation of Healthcare Organizations states:

> Since the majority of perinatal death and injury cases reported root causes related to problems with organizational culture and with communication among caregivers, it is recommended that organizations
>
> 1. Conduct team training in perinatal areas to teach staff to work together and communicate more effectively.
> 2. For high-risk events, such as shoulder dystocia, emergency cesarean delivery, maternal hemorrhage and neonatal resuscitation, conduct clinical drills to help staff prepare for when such events actually occur, and conduct debriefings to evaluate team performance and identify areas for improvement.

In its landmark, 1999 report on medical error and patient safety, the Institute of Medicine wrote, "The Committee believes that health care organizations should establish team training programs for personnel in critical care areas using

From the Department of Obstetrics and Gynecology (K.D., S.W., M.D., J.C.), Stanford University, Stanford, CA; and Department of Obstetrics, Lucile Packard Children's Hospital (J.A., A.C.), Stanford University, Stanford, CA.

Supported by Innovations in Patient Care Grant Program at Lucile Packard Children's Hospital at Stanford.

Presented at the 2008 CREOG/APGO Annual Meeting at Orlando, FL.

Reprints: Kay Daniels, MD, 300 Pasteur Dr H330 MC5317, Stanford, CA 94305 (e-mail address: kdaniels@stanford.edu).

DOI: 10.1097/SIH.0b013e3181b65f22

Prospective Randomized Trial of Simulation Versus Didactic Teaching for Obstetrical Emergencies

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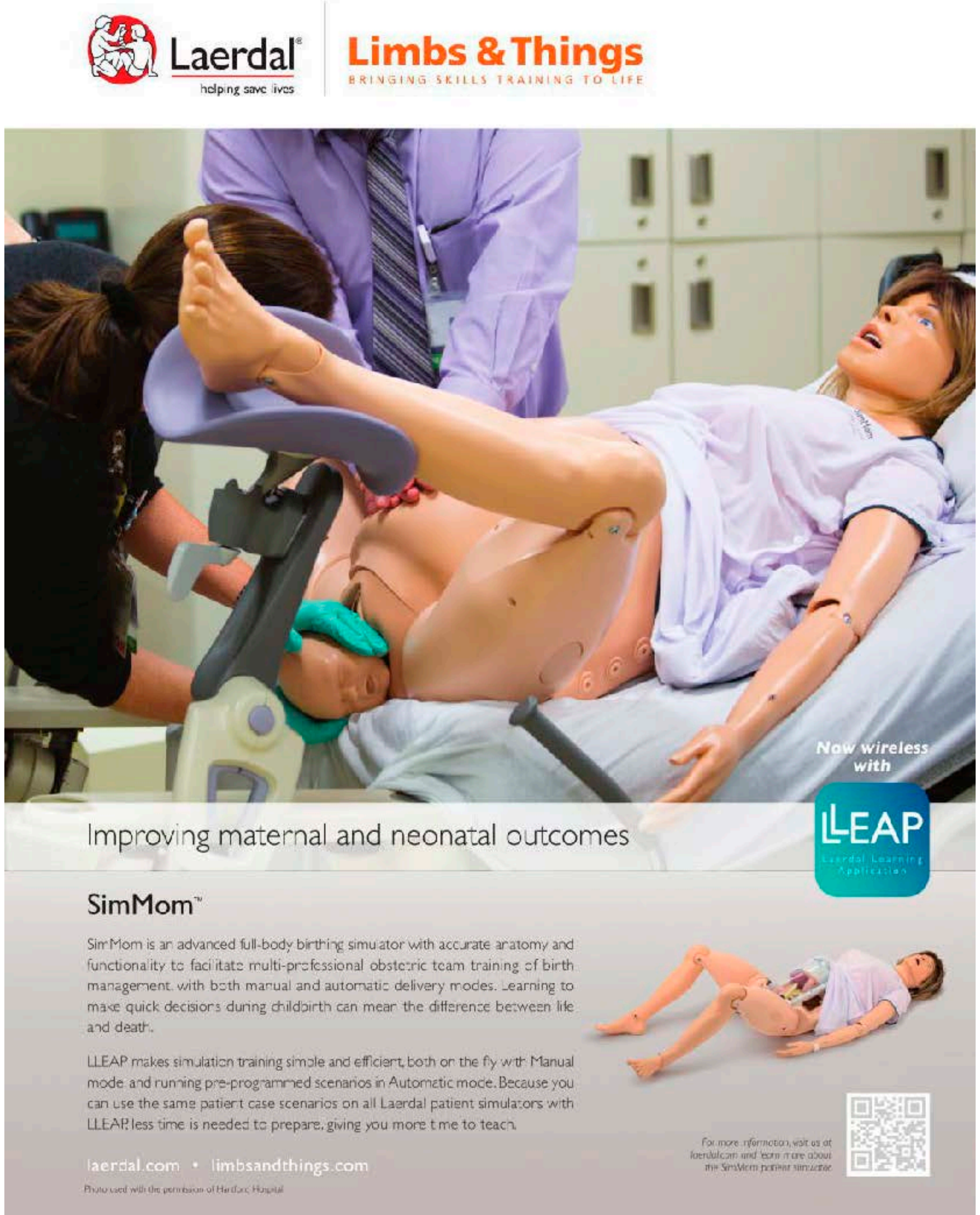
Integrated Technical & Non-Technical Training

Daniels, K., Arafeh, J., Clark, A., Waller, S., Druzin, M., & Chueh, J. (2010). Prospective randomized trial of simulation versus didactic teaching for obstetrical emergencies. *Simulation in Healthcare, 5*(1), 40-45.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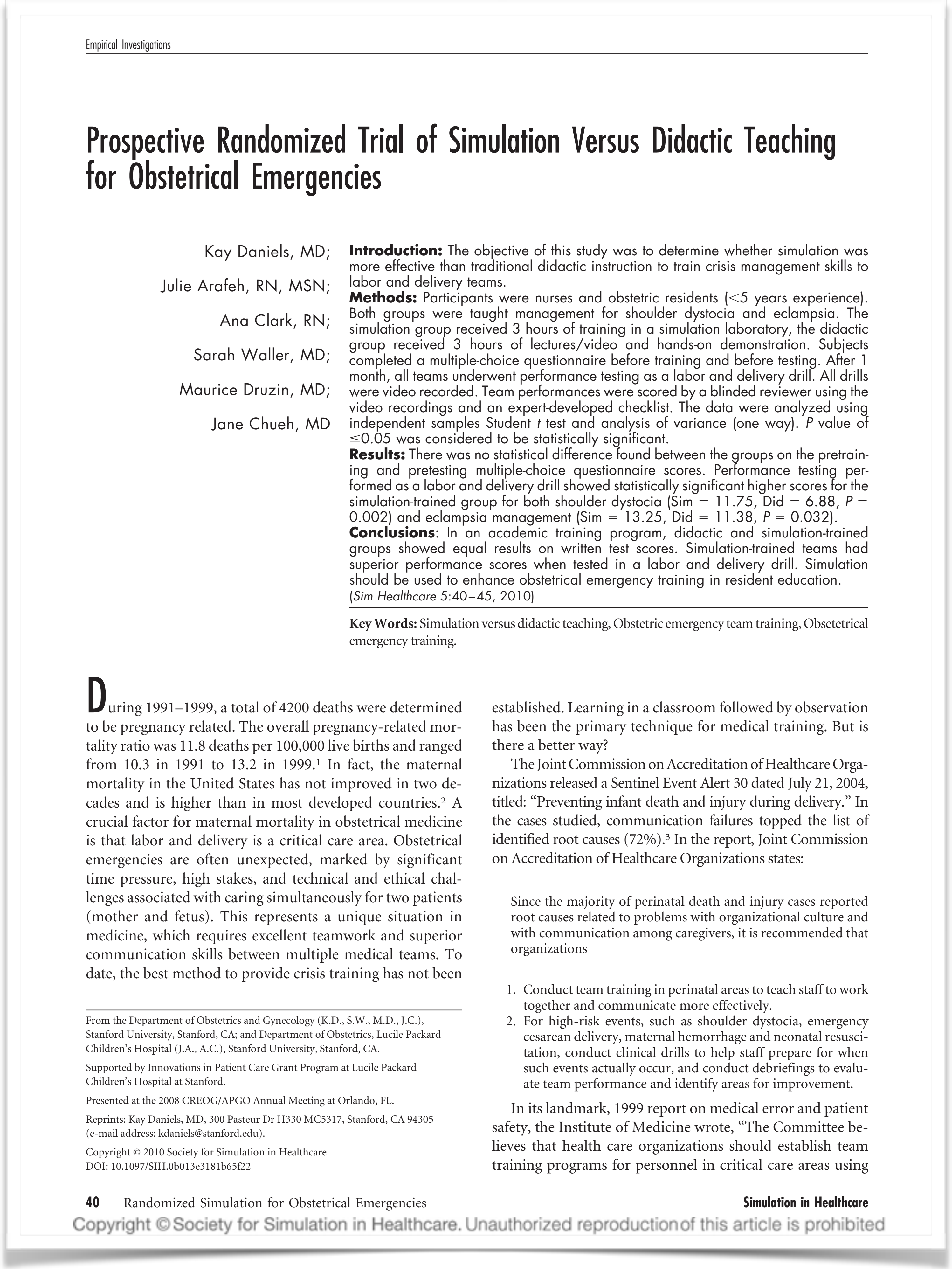

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The classroom is dead...

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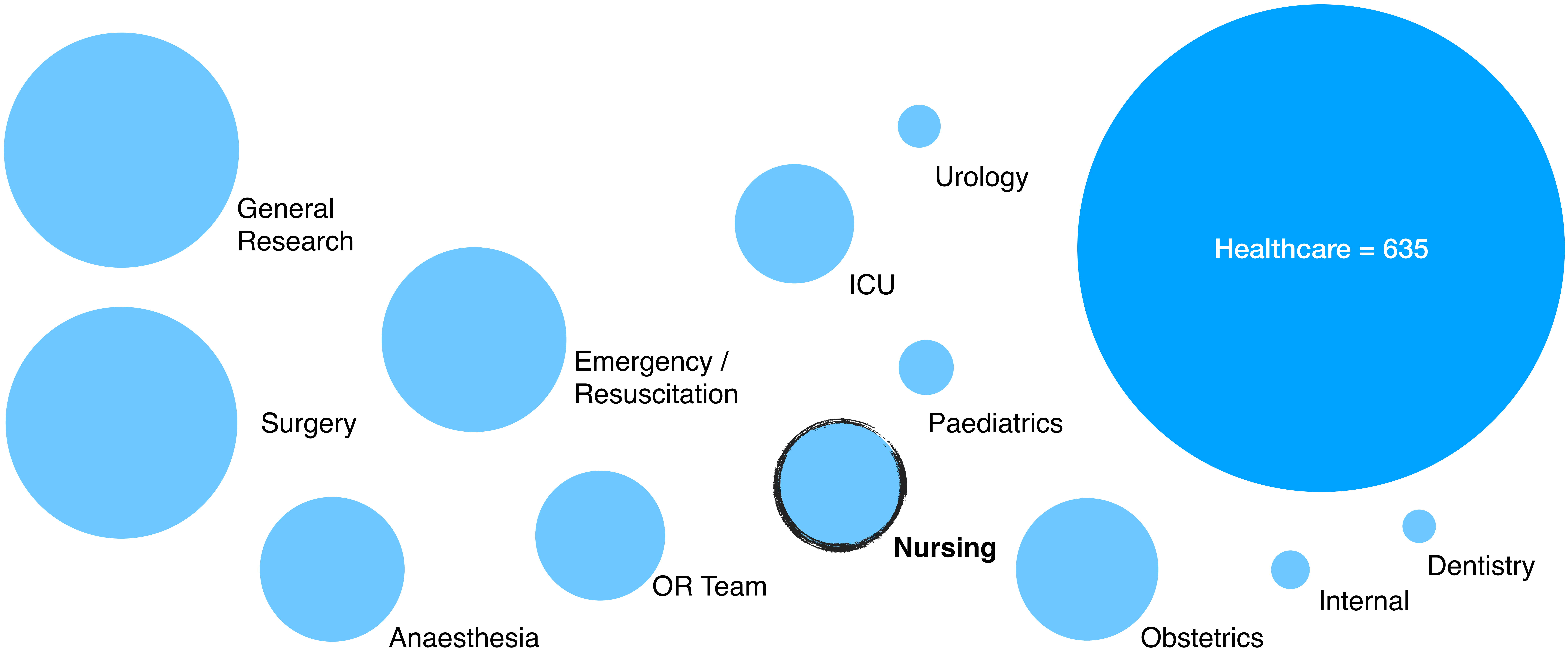
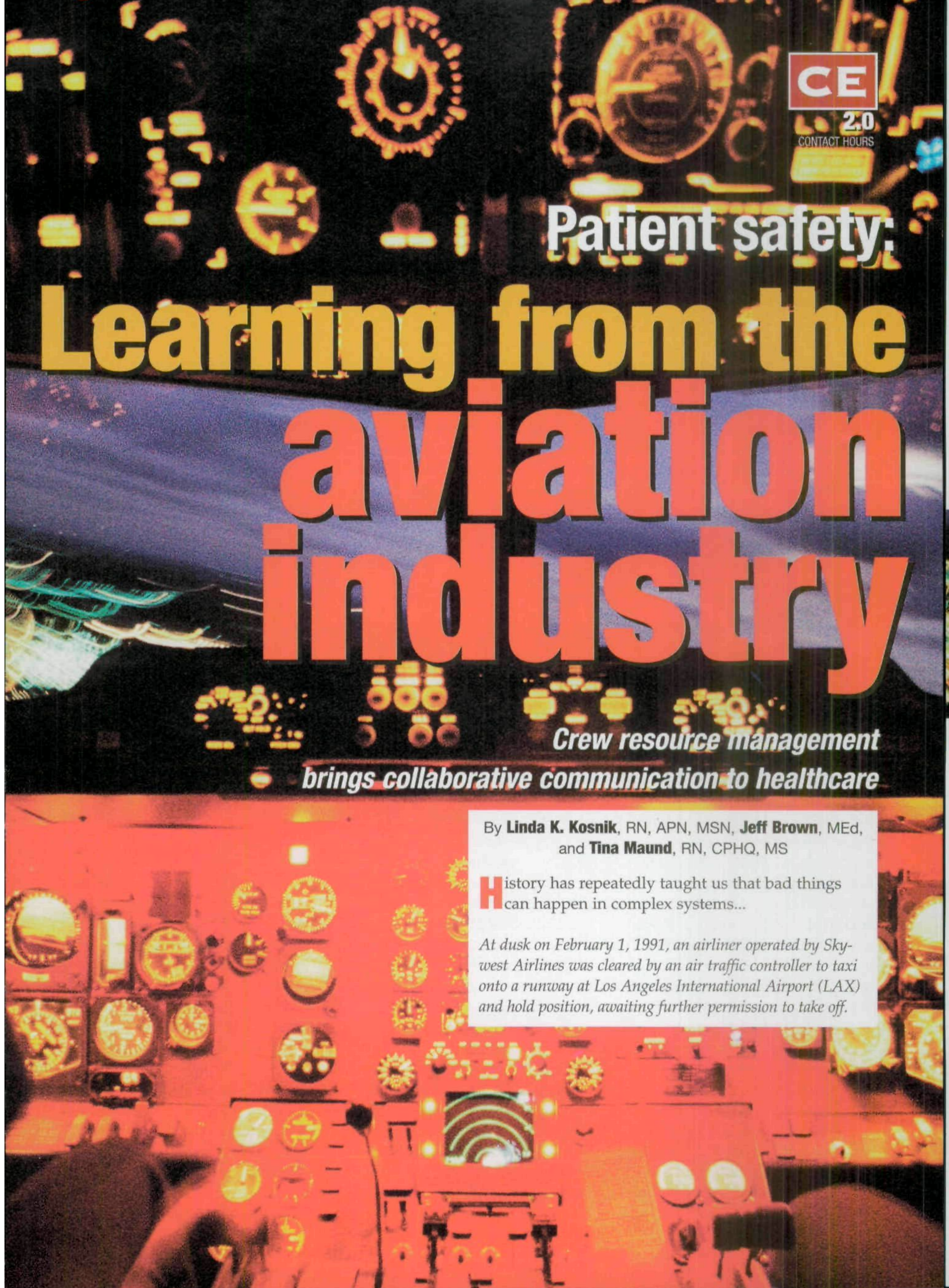
CRM research 2000-present





Patient safety: Learning from the aviation industry

Crew resource management brings collaborative communication to healthcare

By **Linda K. Kosnik**, RN, APN, MSN, **Jeff Brown**, MEd, and **Tina Maund**, RN, CPHQ, MS

History has repeatedly taught us that bad things can happen in complex systems...

At dusk on February 1, 1991, an airliner operated by Skywest Airlines was cleared by an air traffic controller to taxi onto a runway at Los Angeles International Airport (LAX) and hold position, awaiting further permission to take off.

Within 2 minutes the same controller cleared a US Air Boeing 737 to land on the same runway. In the ensuing collision and fire, dozens aboard the 737 were killed or injured, and all 22 of the passengers and crew aboard the Skywest airliner were killed. Not surprisingly, in the aftermath of this tragedy, the controller was vilified by the press and public. Yet, as the National Transportation Safety Board investigation progressed, it became apparent that the conditions of work in the Los Angeles Air Traffic Control Tower at the time of the accident were ripe for provoking her catastrophic lapse of memory.[1]

At the time of the accident, the air traffic controller was managing the arrival and departure of multiple airplanes. Some of the key factors that combined to precipitate the catastrophic event included:

- poor observability of the situation: The controller couldn't directly observe and visually distinguish the aircraft she was in communication with due to the glare of terminal lighting.
- deviation from standard operating procedures related to tracking and handing off flights in progress.
- degraded ability to detect a problem and mitigate related to excessive demands and reliance on short-term memory.[1]

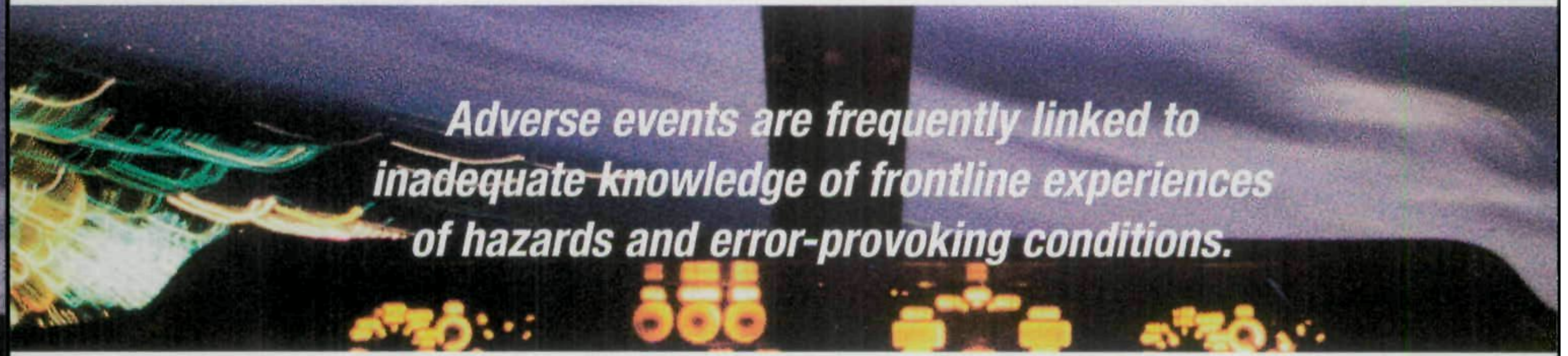
These and other factors, discovered in hindsight, set the stage for human performance failure in a time-pressured and frequently interrupted work environment. The safeguards and countermeasures designed to support error avoidance and limitation had been eroded insidiously over time; this atmosphere wasn't a result of malicious or irresponsible behavior on the part of air traffic controllers or facility managers.

Changes in policy, procedure, and practice can produce latent conditions for failure that unexpectedly couple with dynamic conditions—such as a memory lapse—to provoke active failure.[2] As the next case reveals, tragic accidents of this sort not only happen in aviation; similar opportunities for failure in other socially and technologically complex systems—such as healthcare organizations—abound.

At 1 p.m. on the third floor of General Hospital, a nursing assistant was asked to draw blood for a type and cross for patient Alma Jones in room 305. The assistant walked into room 305 and asked for Alma Jones. The patient in bed one, who happened to have a hearing deficit, answered him and he promptly drew, labeled, and sent the blood off to the lab for a type and cross for 1 unit of PRBCs, having failed to visually check the labels with the patient's ID band. On the next shift at 8 p.m., 1 unit of PRBCs arrived for Alma Jones. Two nurses conscientiously cross-checked the unit of blood with Alma Jones' name band at her bedside in room 305, bed two. Within minutes of the initiation of the blood transfusion, Jones developed shortness of breath and chest pain. The nurse stopped the transfusion immediately, but Jones died shortly thereafter from anaphylaxis due to a blood incompatibility.

The resulting root cause analysis identified the following contributing factors:

- deviation from standard operating procedures
- inadvertent removal of human performance redundancies (verification of two identifiers)
- hearing impediments to patient identification process
- multiple handoffs unsupported by structured communication.

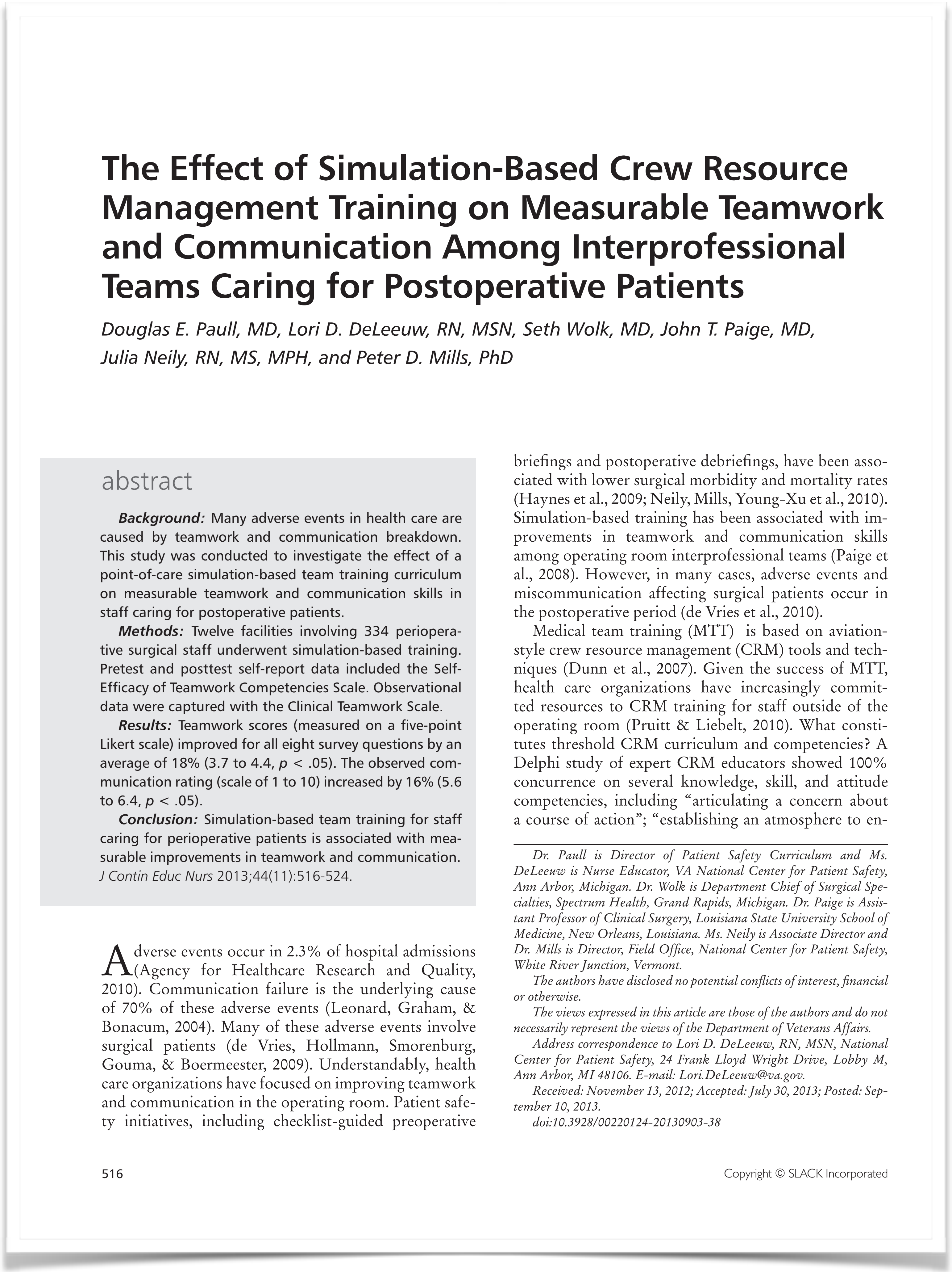


Adverse events are frequently linked to inadequate knowledge of frontline experiences of hazards and error-provoking conditions.

Such human performance breakdowns are inevitable, with the individuals involved being the victims of system defects rather than the main instigators of an accident. At a bird's-eye level, accidents seem to be side effects of decisions made within and among organizations, often over extensive time frames. Adverse events are frequently linked to inadequate knowledge of frontline experiences of hazards and error-provoking conditions. The capability to detect and intervene in such conditions, before they induce tragedy, is of paramount concern.[3]

CRM 1979 to 2006

Crew resource management (CRM) was developed by the aviation industry to reduce the incidence of human errors and related air transportation accidents. The tools and applications of CRM create en-


The Effect of Simulation-Based Crew Resource Management Training on Measurable Teamwork and Communication Among Interprofessional Teams Caring for Postoperative Patients

Douglas E. Paull, MD, Lori D. DeLeeuw, RN, MSN, Seth Wolk, MD, John T. Paige, MD, Julia Neily, RN, MS, MPH, and Peter D. Mills, PhD

abstract

Background: Many adverse events in health care are caused by teamwork and communication breakdown. This study was conducted to investigate the effect of a point-of-care simulation-based team training curriculum on measurable teamwork and communication skills in staff caring for postoperative patients.

Methods: Twelve facilities involving 334 perioperative surgical staff underwent simulation-based training. Pretest and posttest self-report data included the Self-Efficacy of Teamwork Competencies Scale. Observational data were captured with the Clinical Teamwork Scale.

Results: Teamwork scores (measured on a five-point Likert scale) improved for all eight survey questions by an average of 18% (3.7 to 4.4, $p < .05$). The observed communication rating (scale of 1 to 10) increased by 16% (5.6 to 6.4, $p < .05$).

Conclusion: Simulation-based team training for staff caring for perioperative patients is associated with measurable improvements in teamwork and communication.
J Contin Educ Nurs 2013;44(11):516-524.

Adverse events occur in 2.3% of hospital admissions (Agency for Healthcare Research and Quality, 2010). Communication failure is the underlying cause of 70% of these adverse events (Leonard, Graham, & Bonacum, 2004). Many of these adverse events involve surgical patients (de Vries, Hollmann, Smorenburg, Gouma, & Boermeester, 2009). Understandably, health care organizations have focused on improving teamwork and communication in the operating room. Patient safety initiatives, including checklist-guided preoperative briefings and postoperative debriefings, have been associated with lower surgical morbidity and mortality rates (Haynes et al., 2009; Neily, Mills, Young-Xu et al., 2010). Simulation-based training has been associated with improvements in teamwork and communication skills among operating room interprofessional teams (Paige et al., 2008). However, in many cases, adverse events and miscommunication affecting surgical patients occur in the postoperative period (de Vries et al., 2010).

Medical team training (MTT) is based on aviation-style crew resource management (CRM) tools and techniques (Dunn et al., 2007). Given the success of MTT, health care organizations have increasingly committed resources to CRM training for staff outside of the operating room (Pruitt & Liebelt, 2010). What constitutes threshold CRM curriculum and competencies? A Delphi study of expert CRM educators showed 100% concurrence on several knowledge, skill, and attitude competencies, including "articulating a concern about a course of action"; "establishing an atmosphere to en-

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Big focus on inter-professional teams

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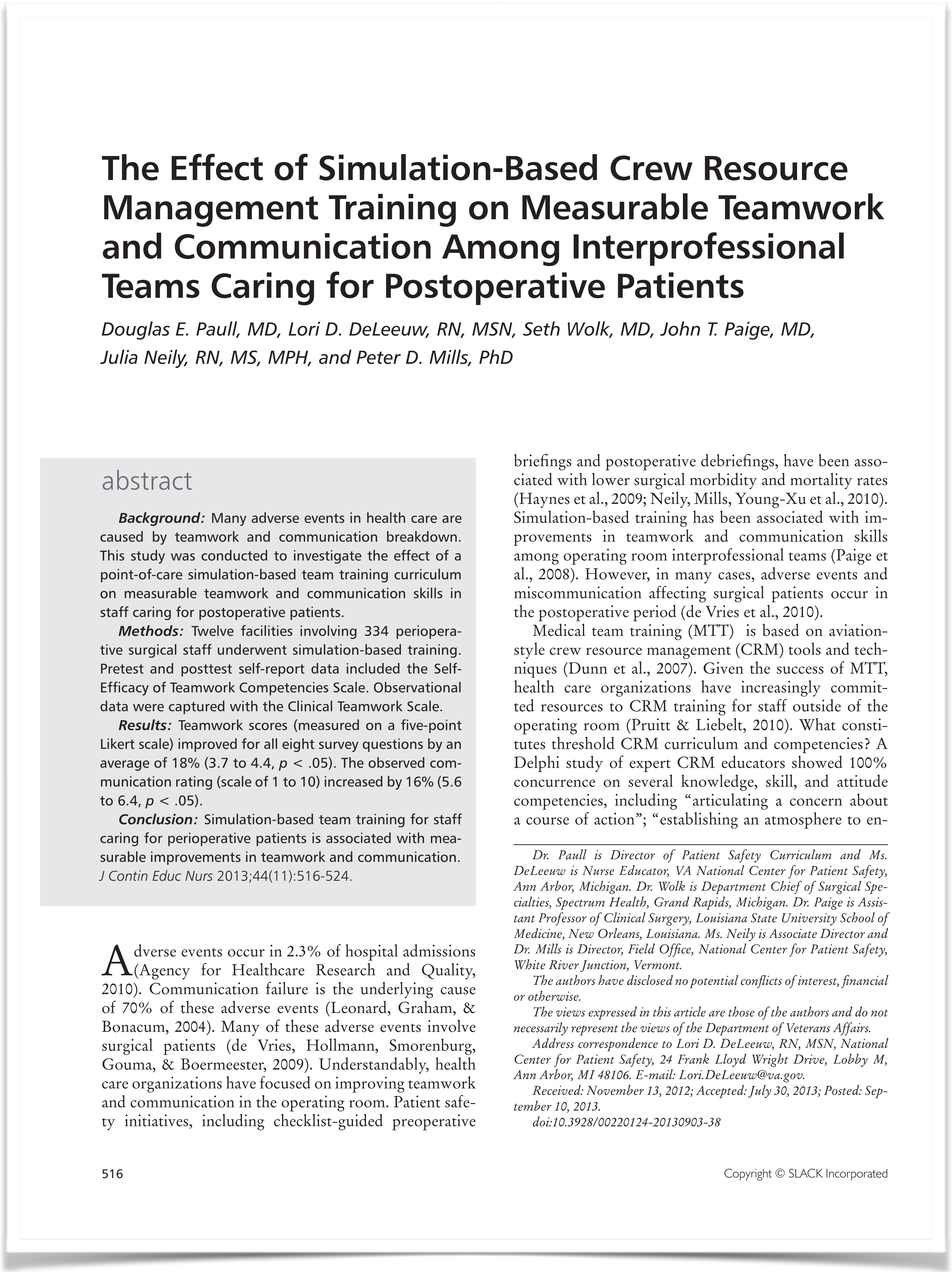

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Measures of Non-Technical Performance used to evaluate training programs...

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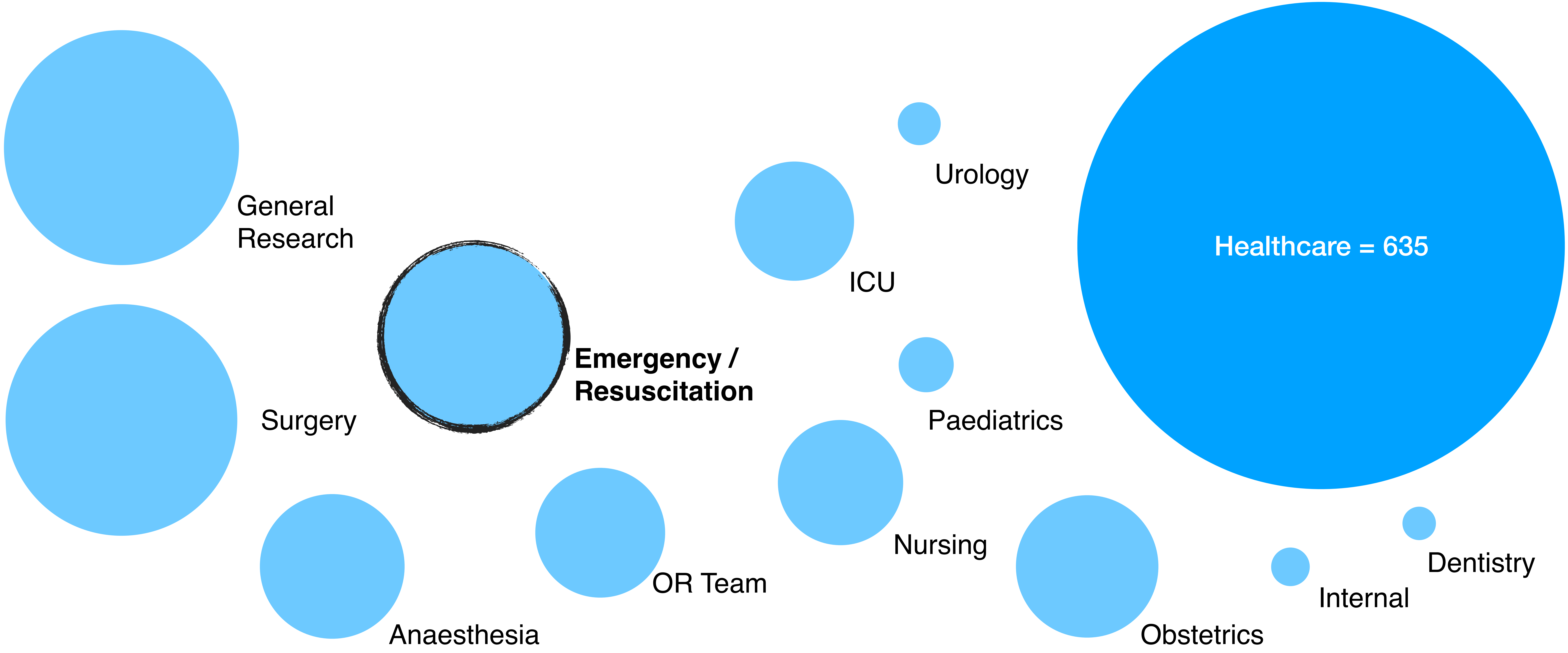
CRM research 2000-present



EMS Academy OPERATIONS TRACK

| By Dick Blanchet, BS, MBA

Crew Resource Management and EMS

How an aviation technique can help us achieve greater scene and transport safety

In the late 1980s, there was a series of airline accidents caused by strings of errors and critical breaks in communication between crew members. In one example, a landing gear malfunction caused the crew to focus on the mechanical problem and getting the cabin crew and passengers ready for a possible gear-up landing. The cabin crew was supposed to advise the captain when they were ready, but due to a communication breakdown never did. The plane ran out of fuel only a few miles from the airport as the pilot waited for the cabin crew to report that they were ready.

Does this type of thing happen in EMS? Many times we might get our attention diverted to a piece of equipment that is not working properly and inadvertently skip priorities like scene safety or airway management. Medication errors are all too easy to make, both in the field and at the hospital. Often, we call medications by one name, yet they are labeled something different. We are all familiar with the name Benadryl, but it may be labeled in your drug box as diphenhydramine.

We must understand that we will always have practitioners with different levels of experience helping us, and they might never have been trained in doing what we ask them to do. Do you store your bag of normal saline in the same compartment as the bag of lidocaine premix? If so, it would be easy to grab the wrong bag and give a bolus of lidocaine instead of saline! Sure, we need to verify the type of fluid given to a patient prior to starting the IV connections, but a little human-factors error trapping can prevent this kind of potentially fatal mistake.

The person in charge of the scene has a different level of experience than other crew members, but should not talk over the heads of colleagues. Sometimes we inadvertently punish each other by using terms that are simply not understood with people who are reluctant to ask for clarification. Good Crew Resource Management (CRM)—an airline practice many have applied to benefit EMS operations—would be to ask if you don't understand.

CRM vs. Healthcare

Preventable accidents were the basis for developing CRM. Actually, it was originally called Cockpit Resource Management and concentrated on coordination within the flight deck only. This was found to be lacking, as the cabin and ground crews are just as important in the process of flying safely.

Does this concept fit with EMS? Yes and no. Airline staff operate as crews: There is a flight deck crew, a cabin crew and a ground crew all working at the same time. The closest we in EMS come to a common term is healthcare providers. This includes all the paramedics, EMTs, dispatchers, first responders, firefighters and even the staff at the emergency department. The term *healthcare provider* certainly does not evoke a mental picture

of teamwork or a crew working together. This is a problem.

In EMS, it is not just the paramedic and EMT who are important to the CRM process. Good resource management involves family members at the scene, fire and police personnel who may have responded, dispatchers, medical control and ED staff, to name a few.

So where do we start? Well, at the beginning of the shift or flight you need to set the tone for the work day. If I have not worked with a person before, I will ask them about their background and experience and tell them a little about myself. I tell them I make mistakes from time to time, and if they are uncomfortable with something or don't understand what we are doing, to simply ask.

If I am not in charge, the same process applies. If the person in charge does not mention these things, I do. I ask a new partner if they have anything specific they like to do on calls. Some paramedics like to carry the equipment into the house to the patient, while others prefer minimal equipment be brought in and most procedures performed in the back of the ambulance. Neither way is wrong, but asking gives me a better understanding of what to expect.

As we go along on the call, I will update my partner on what we have, or think we have, and open the door for him to provide any information pertinent to the situation. This is actually a very critical step. For example, in an airplane I might say, "Crew, we have an engine failure on No. 2. We are going to climb to a safe altitude and then run the checklist." The other crew members may have seen the hydraulic and electrical failures but not noticed the engine failure. They were thinking only of resetting the generator and turning on the backup hydraulic pump instead of the engine not producing thrust.

You may have been called out to a heart attack, but after arrival on scene discovered what you thought was an aortic dissection instead. This involves a completely different treatment—which leaves the rest of the crew, the family and firefighters thinking you're doing a terrible job treating the heart attack. I would like a large-bore IV on the scale of a 14-gauge, and my partner thinks that is way overboard and painful for a person with a heart attack. What should I have said, and what should my partner say to clarify? Right now we don't seem to be on the same page.

One of the key components of CRM is recognizing that you should provide others with information, and solicit it from them as well. For example, while running a cardiac arrest, the lead paramedic says, "Everyone shut up, I need to concentrate." From a CRM perspective, this would be totally wrong. Perhaps the EMT or firefighter has a list of the patient's medications that hints at hypoglycemia as the cause of their cardiac arrest. You can calm the scene without shutting down all communication.

Perhaps it's better to say, "The patient is pulseless and apneic, and we want good CPR and ventilations. Let's keep the voice level at a normal volume, please. Does anyone have any information as to the cause of the arrest?"

There are a few phrases in the cockpit (and an ambulance) that are absolute red flags and demand the captain's (paramedic's) immediate attention:

- "I have no idea what you are asking me to do."
- "Is this legal?"
- "I am totally lost."
- "Who's in charge?"

What do you do when you hear something like this? The person in charge needs to recognize that there is a problem and clearly state both the situation (e.g., possible heart attack, three trauma victims, etc.) and a plan of action with priorities. Finally, they must provide specific assignments for team members: "We have three trauma patients. The male in the driver's seat is our top priority for treatment and transport, and all need to be trauma packaged. The second unit to arrive will take the passengers in the backseat, who have minor injuries. Both of you guys bring the trauma equipment for three patients. Let's work together, and if you see something that concerns you, speak up. Questions?"

Have you ever been on an EMS call and, in bringing the cot into the house, been told by your partner, "We need to hurry." You probably complied, but didn't have a clue why. What you may have missed was that the patient, by his signs and symptoms, may have had something like an aortic dissection. By not knowing, you might have handled the patient more roughly, for the sake of that requested speed, than you would have otherwise.

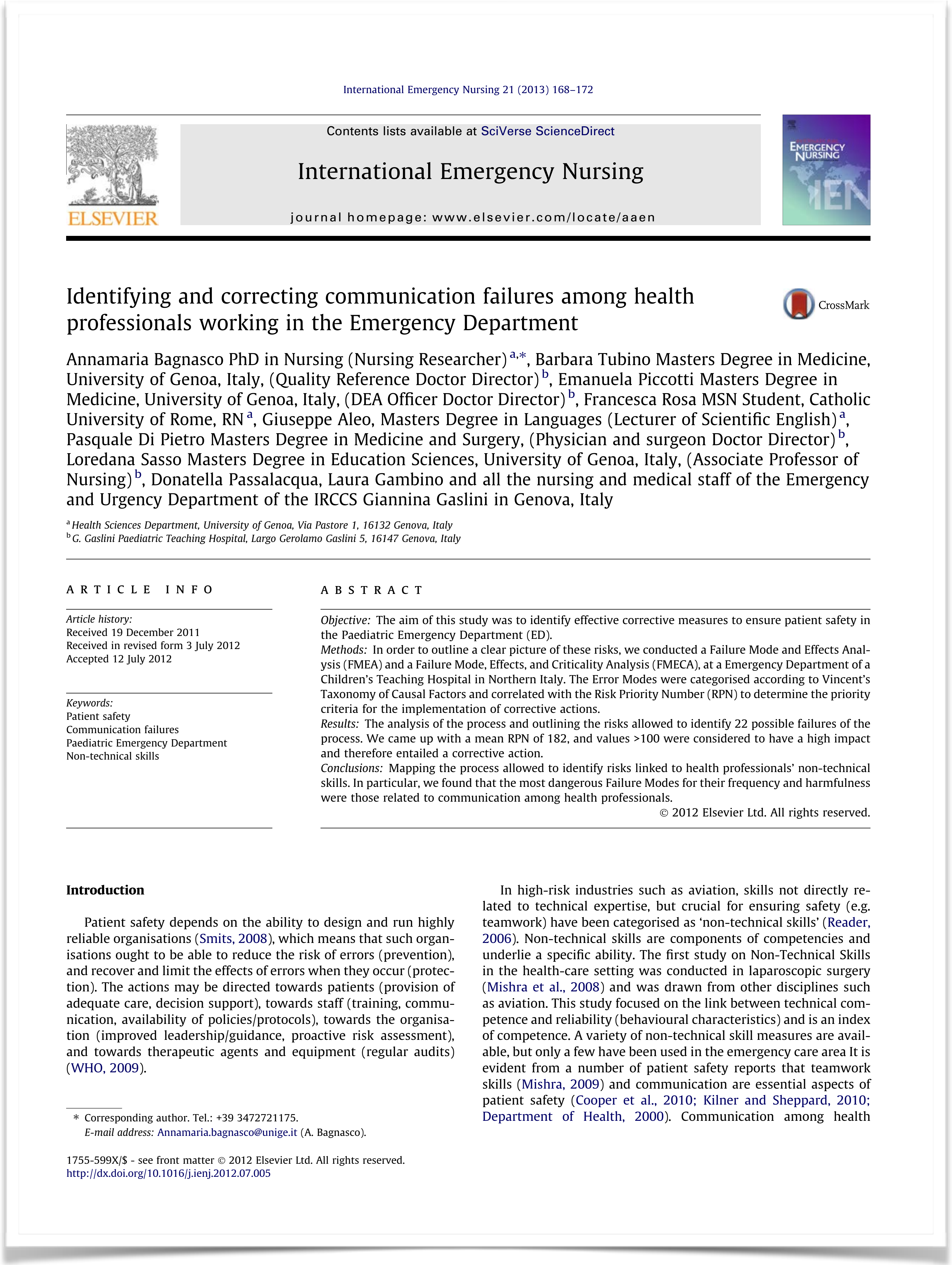
One of the greatest fears in the beginning of CRM was that the airline captain would lose his command authority. This turned out not to be the case. In a medical emergency, the other responders want leadership and direction. If you are in charge, give it to them. This might include correcting others' mistakes. People get excited at cardiac arrests and might be doing the ventilations or compressions too fast. This can be corrected without abusing the person. At the moment, you might not have time to explain all the reasons why, but you must follow up later with an explanation.

Frequent recaps of where you are, what you've done and what's next are critical to the process. These allow people to error-trap things that should have been done. If a person is gasping for breath and can only speak in two-word sentences, I will start the *B* of breathing with oxygen via a nonrebreather mask. A pulse oximeter is not high on my list of things to do for this call at this moment. The O_2 needs to go first. On other calls, getting a room-air O_2 saturation is appropriate. Could I have overlooked the pulse oximeter completely as I worked to perform the other procedures? Of course—I am human.

What about afterward? Recap the call and discuss it openly! After an EMS call or a flight from JFK to Europe or Asia, I talk with the other crew members about what we did well and what we could have done better. If there is something you'd prefer other crew member did differently, this is the time to mention it. This will open the atmosphere for discussion and bring problems folks might not have been aware of into the open.

Dick Blanchet, BS, MBA, has worked as a paramedic for Abbott EMS in St. Louis, MO, and Illinois for more than 20 years. He is also an airline captain on a Boeing 747 with more than 17,000 flight hours.

Identifying and correcting communication failures among health professionals working in the Emergency Department



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A B S T R A C T

Objective: The aim of this study was to identify effective corrective measures to ensure patient safety in the Paediatric Emergency Department (ED).
Methods: In order to outline a clear picture of these risks, we conducted a Failure Mode and Effects Analysis (FMEA) and a Failure Mode, Effects, and Criticality Analysis (FMECA), at a Emergency Department of a Children's Teaching Hospital in Northern Italy. The Error Modes were categorised according to Vincent's Taxonomy of Causal Factors and correlated with the Risk Priority Number (RPN) to determine the priority criteria for the implementation of corrective actions.
Results: The analysis of the process and outlining the risks allowed to identify 22 possible failures of the process. We came up with a mean RPN of 182, and values >100 were considered to have a high impact and therefore entailed a corrective action.
Conclusions: Mapping the process allowed to identify risks linked to health professionals' non-technical skills. In particular, we found that the most dangerous Failure Modes for their frequency and harmfulness were those related to communication among health professionals.

Introduction

Patient safety depends on the ability to design and run highly reliable organisations (Smits, 2008), which means that such organisations ought to be able to reduce the risk of errors (prevention), and recover and limit the effects of errors when they occur (protection). The actions may be directed towards patients (provision of adequate care, decision support), towards staff (training, communication, availability of policies/protocols), towards the organisation (improved leadership/guidance, proactive risk assessment), and towards therapeutic agents and equipment (regular audits) (WHO, 2009).

In high-risk industries such as aviation, skills not directly related to technical expertise, but crucial for ensuring safety (e.g. teamwork) have been categorised as 'non-technical skills' (Reader, 2006). Non-technical skills are components of competencies and underlie a specific ability. The first study on Non-Technical Skills in the health-care setting was conducted in laparoscopic surgery (Mishra et al., 2008) and was drawn from other disciplines such as aviation. This study focused on the link between technical competence and reliability (behavioural characteristics) and is an index of competence. A variety of non-technical skill measures are available, but only a few have been used in the emergency care area It is evident from a number of patient safety reports that teamwork skills (Mishra, 2009) and communication are essential aspects of patient safety (Cooper et al., 2010; Kilner and Sheppard, 2010; Department of Health, 2000). Communication among health

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Proactive identification of HF risks...

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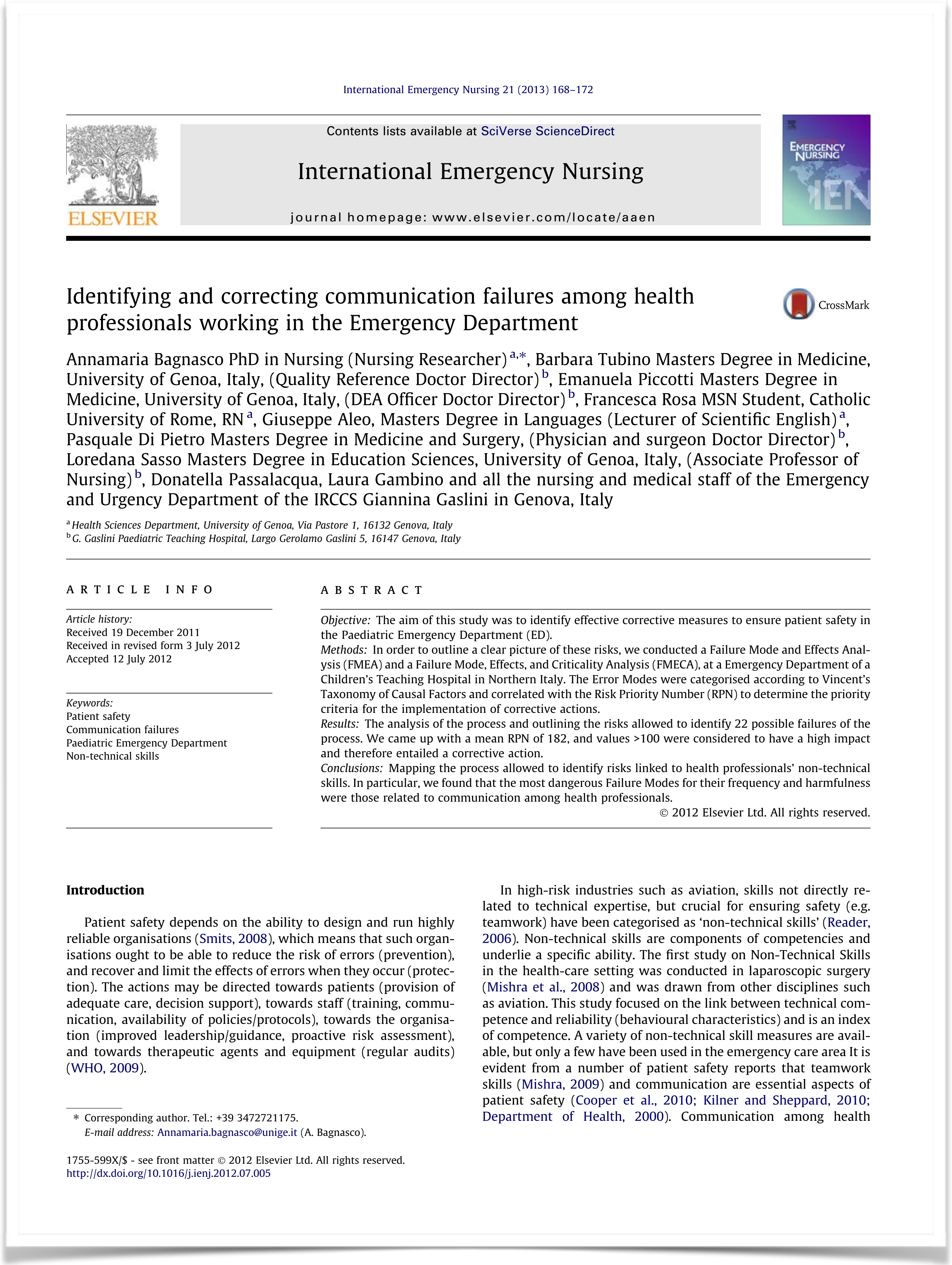
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Identifying and correcting communication failures among health professionals working in the Emergency Department

Mapping the process allowed to identify risks linked to health professionals' non-technical skills. Our results supported the need for more appropriate communication training for health professionals working in Emergency Departments and other similar workplaces.

Proactive Risk-based Training Needs Analysis

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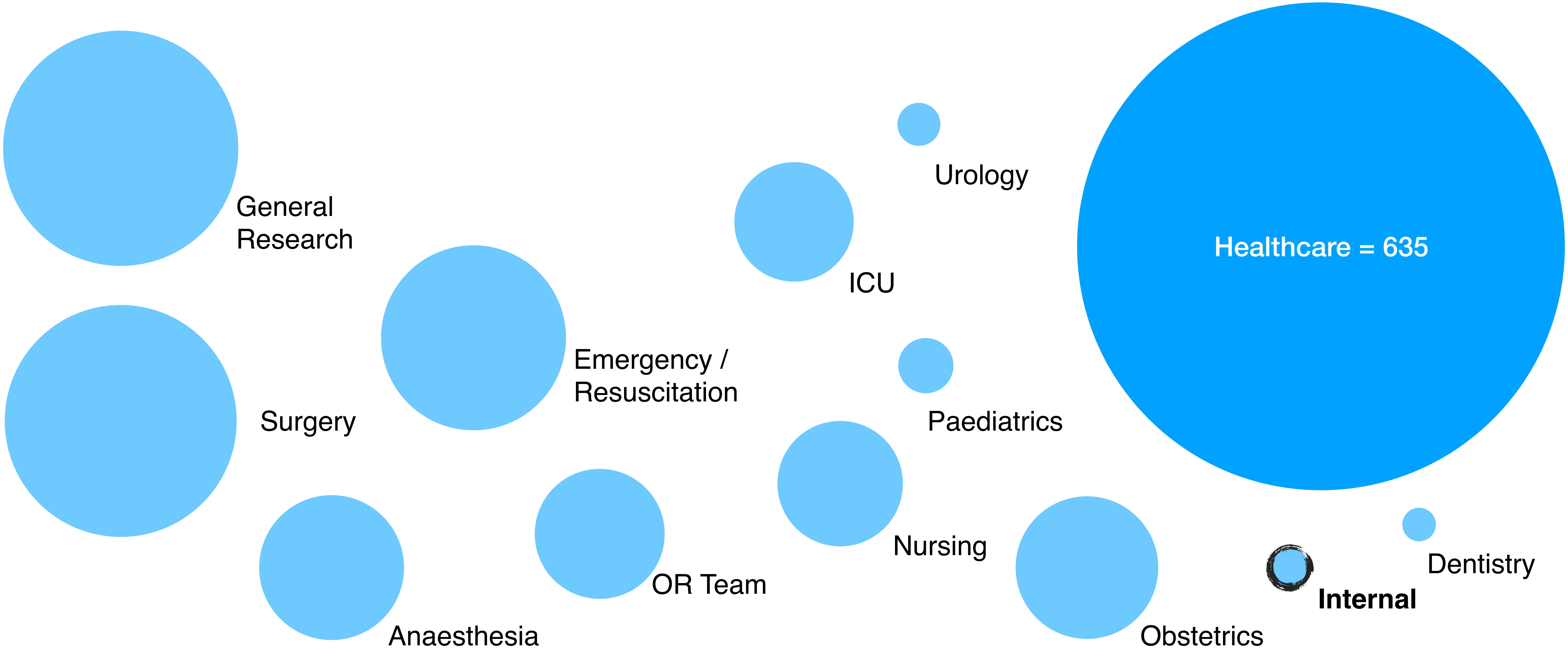
CRM research 2000-present



Improving patient safety using the sterile cockpit principle during medication administration: A collaborative, unit-based project


Journal of Nursing Management, 2013, **21,** 106–111

Improving patient safety using the sterile cockpit principle during medication administration: a collaborative, unit-based project

AMANDA M. FORE RN, MS[1], GARY L. SCULLI RN, MSN, ATP[2], DOREEN ALBEE RN, MSN[3] and JULIA NEILY RN, MS, MPH[4]

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FORE A.M., SCULLI G.L., ALBEE D. & NEILY J. (2013) *Journal of Nursing Management* **21,** 106–111
Improving patient safety using the sterile cockpit principle during medication administration: a collaborative, unit-based project

Aim To implement the sterile cockpit principle to decrease interruptions and distractions during high volume medication administration and reduce the number of medication errors.
Background While some studies have described the importance of reducing interruptions as a tactic to reduce medication errors, work is needed to assess the impact on patient outcomes.
Methods Data regarding the type and frequency of distractions were collected during the first 11 weeks of implementation. Medication error rates were tracked 1 year before and after 1 year implementation.
Results Simple regression analysis showed a decrease in the mean number of distractions, ($\beta = -0.193$, $P = 0.02$) over time. The medication error rate decreased by 42.78% ($P = 0.04$) after implementation of the sterile cockpit principle.
Conclusions The use of crew resource management techniques, including the sterile cockpit principle, applied to medication administration has a significant impact on patient safety.
Implications for nursing management Applying the sterile cockpit principle to inpatient medical units is a feasible approach to reduce the number of distractions during the administration of medication, thus, reducing the likelihood of medication error. 'Do Not Disturb' signs and vests are inexpensive, simple interventions that can be used as reminders to decrease distractions.

Keywords: crew resource management, distractions, medication administration, nursing, patient safety

Accepted for publication: 13 February 2012

Background

The administration of medication requires a complex mixture of varied and often competing responsibilities that structure the nurses' work day (Jennings *et al.* 2011). A substantial number of interruptions occur when nurses are involved in preparing or administering medication (Hall *et al.* 2010). Furthermore, interruptions

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The use of crew resource management techniques, including the sterile cockpit principle, applied to medication administration has a significant impact on patient safety.

Evidence-based changes in practice...

Fore, A. M., Sculli, G. L., Albee, D., & Neily, J. (2013). Improving patient safety using the sterile cockpit principle during medication administration: A collaborative, unit-based project. *Journal of Nursing Management, 21*(1), 106-111.


DO NOT DISTURB
DRUG ROUND
IN PROGRESS
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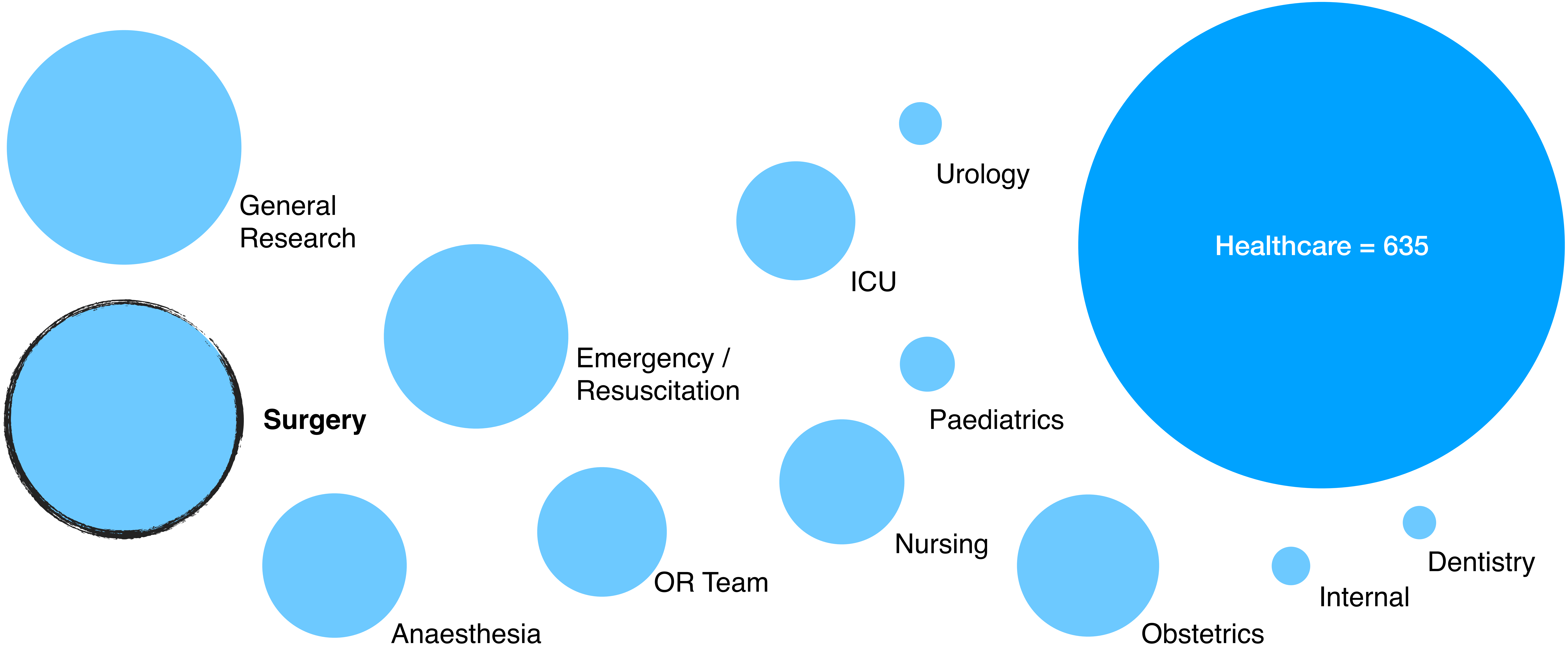
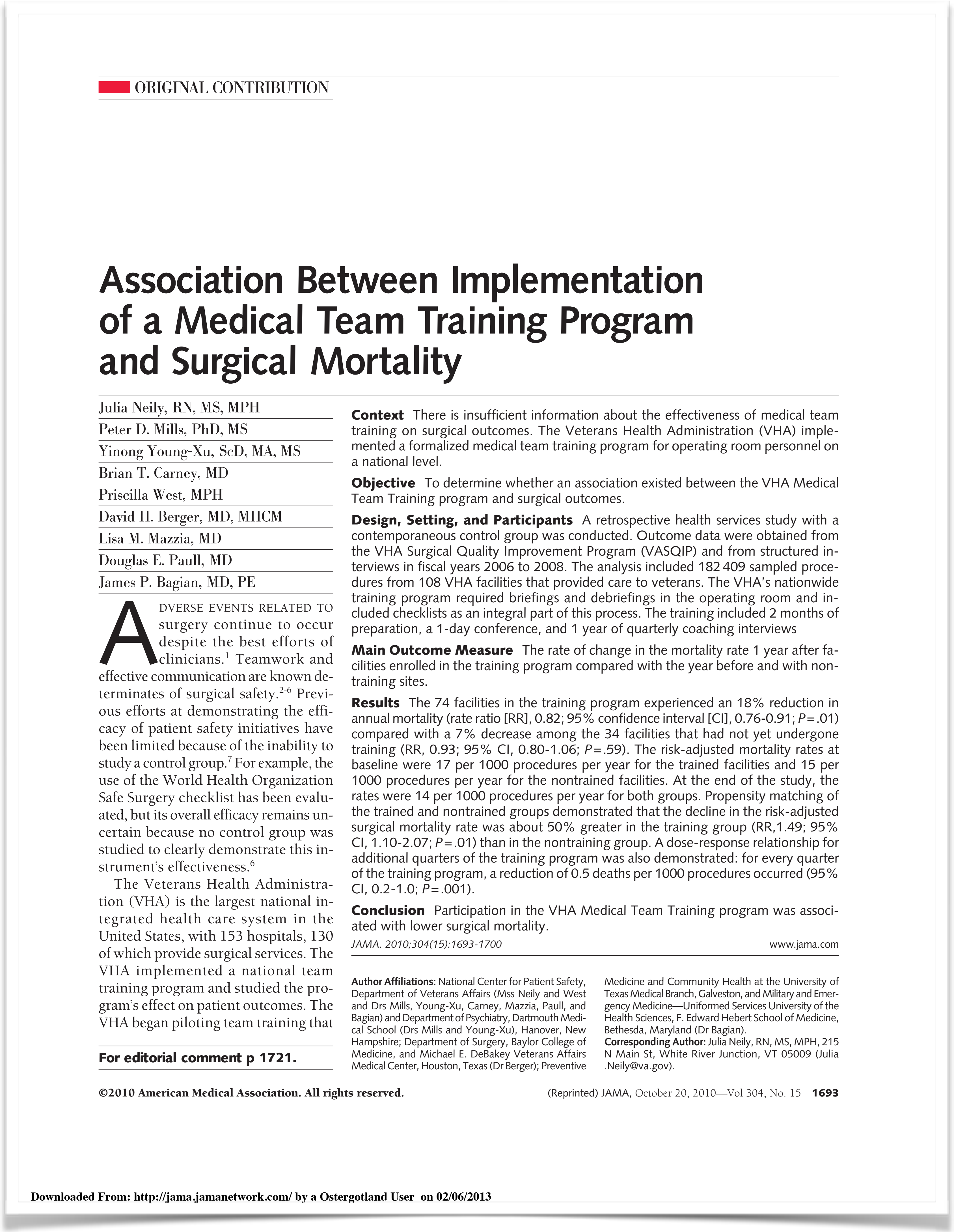
CRM research 2000-present




ORIGINAL CONTRIBUTION

Association Between Implementation of a Medical Team Training Program and Surgical Mortality

Julia Neily, RN, MS, MPH
Peter D. Mills, PhD, MS
Yinong Young-Xu, ScD, MA, MS
Brian T. Carney, MD
Priscilla West, MPH
David H. Berger, MD, MHCM
Lisa M. Mazzia, MD
Douglas E. Paull, MD
James P. Bagian, MD, PE

Context There is insufficient information about the effectiveness of medical team training on surgical outcomes. The Veterans Health Administration (VHA) implemented a formalized medical team training program for operating room personnel on a national level.

Objective To determine whether an association existed between the VHA Medical Team Training program and surgical outcomes.

Design, Setting, and Participants A retrospective health services study with a contemporaneous control group was conducted. Outcome data were obtained from the VHA Surgical Quality Improvement Program (VASQIP) and from structured interviews in fiscal years 2006 to 2008. The analysis included 182 409 sampled procedures from 108 VHA facilities that provided care to veterans. The VHA's nationwide training program required briefings and debriefings in the operating room and included checklists as an integral part of this process. The training included 2 months of preparation, a 1-day conference, and 1 year of quarterly coaching interviews

Main Outcome Measure The rate of change in the mortality rate 1 year after facilities enrolled in the training program compared with the year before and with nontraining sites.

Results The 74 facilities in the training program experienced an 18% reduction in annual mortality (rate ratio [RR], 0.82; 95% confidence interval [CI], 0.76-0.91; *P*=.01) compared with a 7% decrease among the 34 facilities that had not yet undergone training (RR, 0.93; 95% CI, 0.80-1.06; *P*=.59). The risk-adjusted mortality rates at baseline were 17 per 1000 procedures per year for the trained facilities and 15 per 1000 procedures per year for the nontrained facilities. At the end of the study, the rates were 14 per 1000 procedures per year for both groups. Propensity matching of the trained and nontrained groups demonstrated that the decline in the risk-adjusted surgical mortality rate was about 50% greater in the training group (RR,1.49; 95% CI, 1.10-2.07; *P*=.01) than in the nontraining group. A dose-response relationship for additional quarters of the training program was also demonstrated: for every quarter of the training program, a reduction of 0.5 deaths per 1000 procedures occurred (95% CI, 0.2-1.0; *P*=.001).

Conclusion Participation in the VHA Medical Team Training program was associated with lower surgical mortality.

JAMA. 2010;304(15):1693-1700 www.jama.com

Adverse events related to surgery continue to occur despite the best efforts of clinicians.[1] Teamwork and effective communication are known determinates of surgical safety.[2-6] Previous efforts at demonstrating the efficacy of patient safety initiatives have been limited because of the inability to study a control group.[7] For example, the use of the World Health Organization Safe Surgery checklist has been evaluated, but its overall efficacy remains uncertain because no control group was studied to clearly demonstrate this instrument's effectiveness.[6]

The Veterans Health Administration (VHA) is the largest national integrated health care system in the United States, with 153 hospitals, 130 of which provide surgical services. The VHA implemented a national team training program and studied the program's effect on patient outcomes. The VHA began piloting team training that

For editorial comment p 1721.

Author Affiliations: National Center for Patient Safety, Department of Veterans Affairs (Mss Neily and West and Drs Mills, Young-Xu, Carney, Mazzia, Paull, and Bagian) and Department of Psychiatry, Dartmouth Medical School (Drs Mills and Young-Xu), Hanover, New Hampshire; Department of Surgery, Baylor College of Medicine, and Michael E. DeBakey Veterans Affairs Medical Center, Houston, Texas (Dr Berger); Preventive Medicine and Community Health at the University of Texas Medical Branch, Galveston, and Military and Emergency Medicine—Uniformed Services University of the Health Sciences, F. Edward Hebert School of Medicine, Bethesda, Maryland (Dr Bagian).
Corresponding Author: Julia Neily, RN, MS, MPH, 215 N Main St, White River Junction, VT 05009 (Julia .Neily@va.gov).

Association between implementation of a medical team training program and surgical mortality

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Evidence-based changes in practice...

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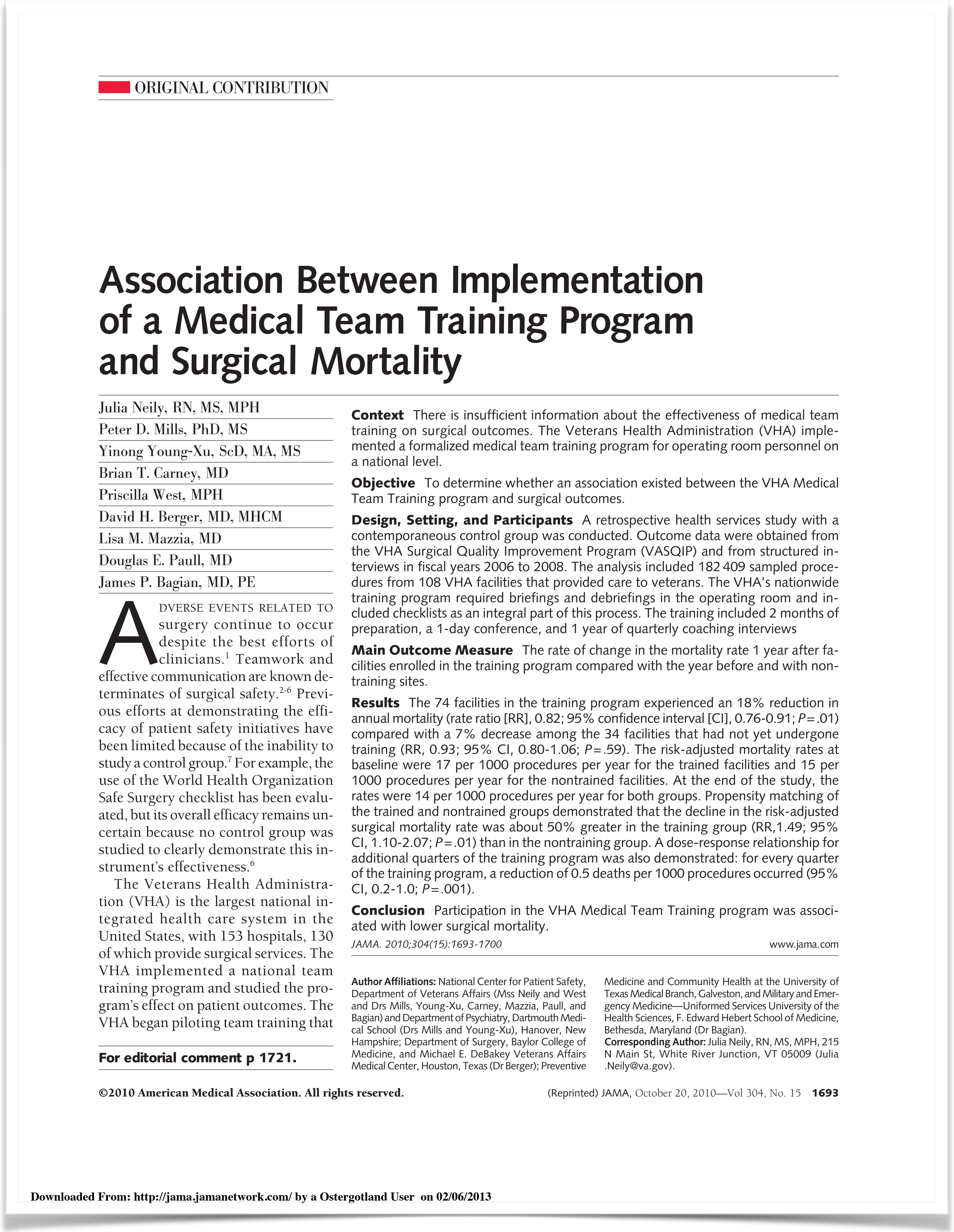

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Demonstrating Return on investment...

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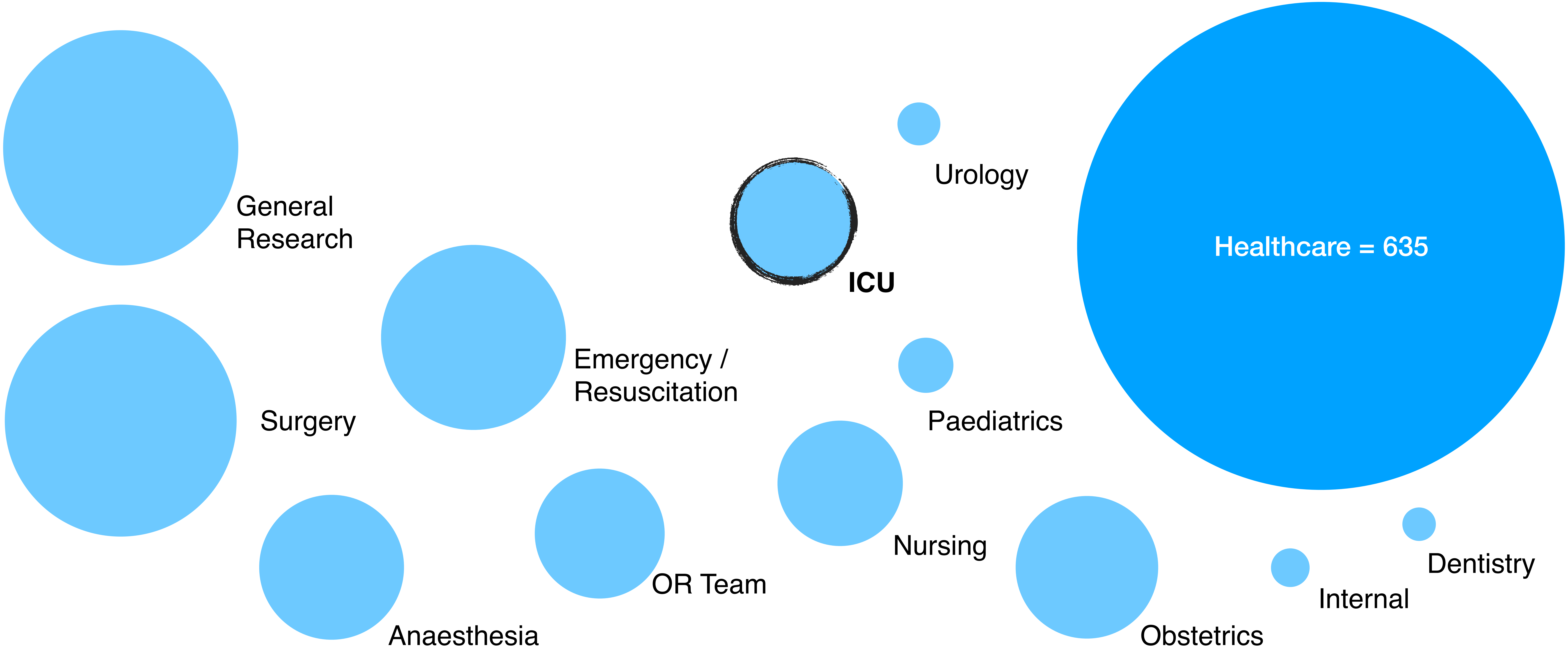
CRM research 2000-present




Challenging Authority During an Emergency—the Effect of a Te... : Critical Care Medicine 8/8/17, 11:22 pm

Challenging Authority During an Emergency—the Effect of a Teaching Intervention

Friedman, Zeev MD[1]; Perelman, Vsovolod MD, MSc, CCFP(EM)[1]; McLuckie, Duncan FRCPC[2]; Andrews, Meghan FRCPC[3]; Noble, Laura M. K. RRT[1]; Malavade, Archana MBBS, FCPS (Anesthesia)[4]; Bould, M. Dylan MBChB, MEd, FRCA[2]

Critical Care Medicine: August 2017 - Volume 45 - Issue 8 - p e814–e820
doi: 10.1097/CCM.0000000000002450
Online Clinical Investigations

Abstract **Author Information**

Objectives: Previous research has shown that residents were unable to effectively challenge a superior's wrong decision during a crisis situation, a problem that can contribute to preventable mortality. We aimed to assess whether a teaching intervention enabled residents to effectively challenge clearly wrong clinical decisions made by their staff.

Subjects and Intervention: Following ethics board approval, second year residents were randomized to a teaching intervention targeting cognitive skills needed to challenge a superior's decision, or a control group receiving general crisis management instruction. Two weeks later, subjects participated in a simulated crisis that presented them with opportunities to challenge clearly wrong decisions in a can't-intubate-can't-ventilate scenario. It was only disclosed that the staff was a confederate during the debriefing. Performances were video recorded and assessed by two raters blinded to group allocation using the modified Advocacy-Inquiry Score.

Measurements and Main Results: Fifty residents completed the study. The interrater reliability of the modified Advocacy-Inquiry Scores (intraclass correlation coefficient = 0.87) was excellent. The median (interquartile range) best modified Advocacy-Inquiry Score was significantly better in the intervention group 5.0 (4.50–5.62 [4–6]) than in the control group 3.5 (3.0–4.75 [3–6]) ($p < 0.001$).

Conclusions: A short targeted teaching intervention was effective in significantly improving residents' ability to challenge a wrong decision by a superior. This suggests that residents are not given the proper tools to challenge authority during a life-threatening crisis situation. This educational gap can have significant implications for patients' safety.

[1]Department of Anesthesia and Pain Management, Mount Sinai Hospital, University of Toronto, Toronto, ON, Canada.

[2]Department of Anesthesiology, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, ON, Canada.

[3]Department of Anesthesiology, The Montfort Hospital, Ottawa, ON, Canada.

http://journals.lww.com/ccmjournal/Abstract/2017/08000/Challenging_Authority_During_an_Emergency_the.37.aspx Page 1 of 2

Challenging authority during an emergency - The effect of a teaching intervention

Previous research has shown that residents were unable to effectively challenge a superior's wrong decision during a crisis situation, a problem that can contribute to preventable mortality.

We aimed to assess whether a teaching intervention enabled residents to effectively challenge clearly wrong clinical decisions made by a superior.

Tangible skill development

Friedman, Z., Perelman, V., McLuckie, D., Andrews, M., Noble, L. M. K., Malavade, A., & Bould, M. D. (2017). Challenging authority during an emergency - The effect of a teaching intervention. *Critical Care Medicine, 45*(8), e814-e820.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Challenging authority during an emergency - The effect of a teaching intervention

Subjects participated in a simulated crisis that presented them with opportunities to challenge clearly wrong decisions in a can't-intubate-can't-ventilate scenario.

A senior colleague in the scenario was scripted to make a wrong decision.

A short targeted teaching intervention was effective in significantly improving residents' ability to challenge a wrong decision by a superior.

Use of a "confederate"...

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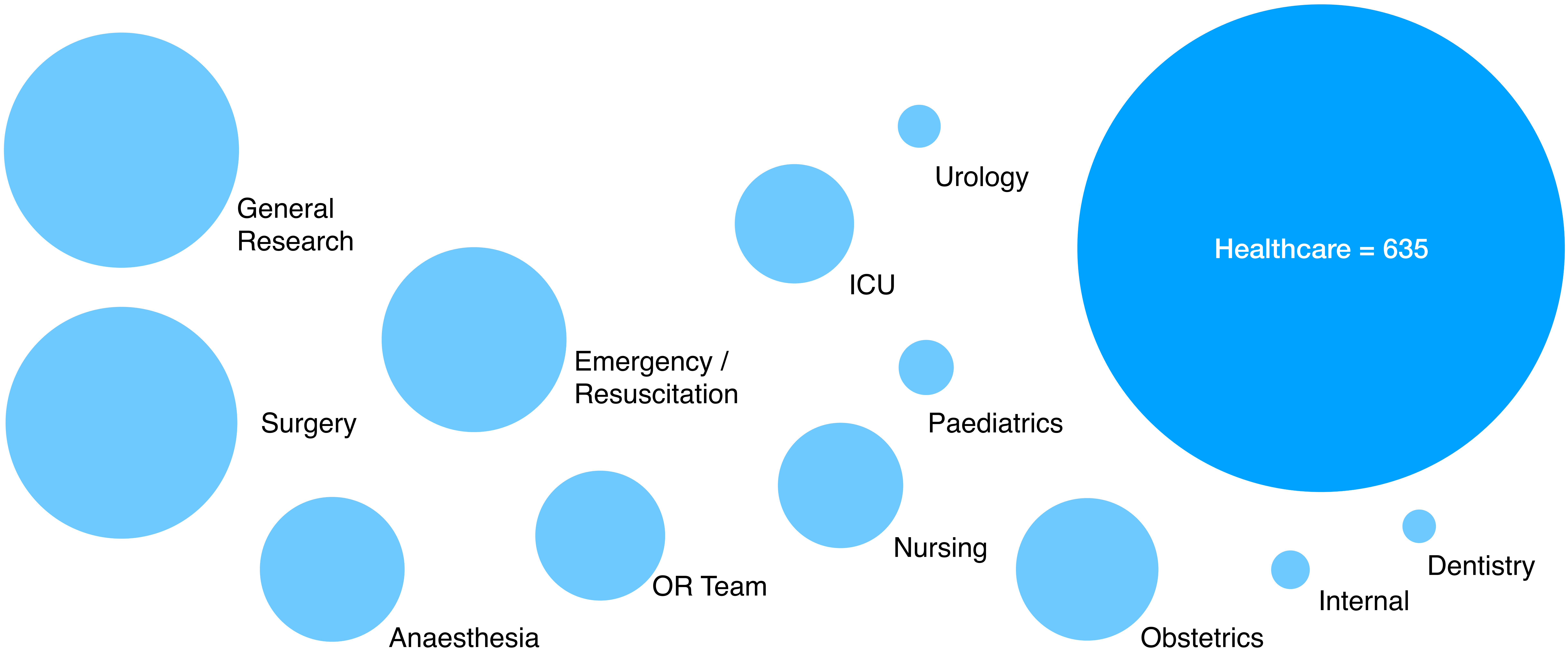
CRM research 2000-present



CRM - and much more…

Integrating technical and non-technical

Extensive use of simulation

Focus on tangible skill development

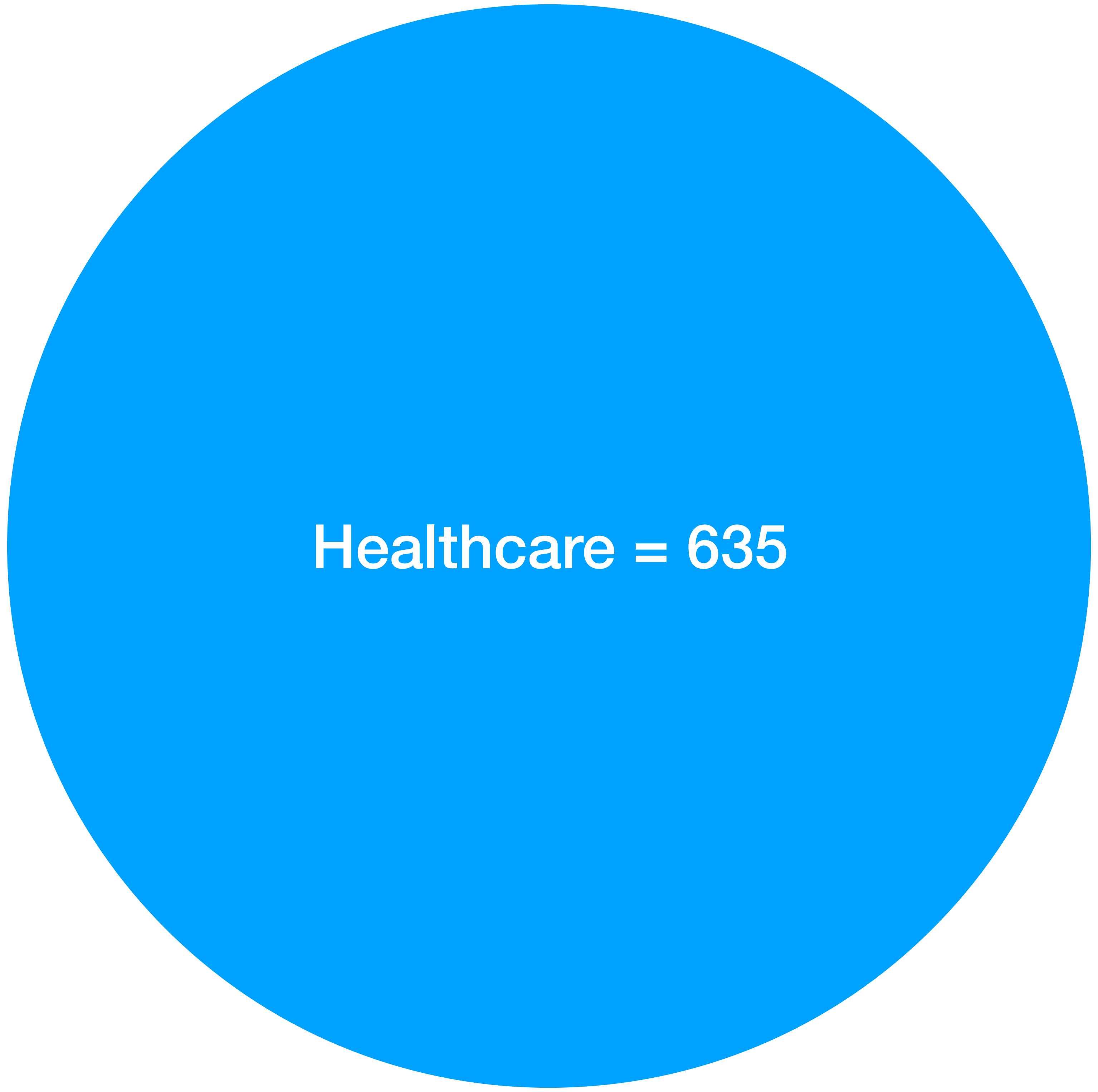
Targeting inter-professional teams

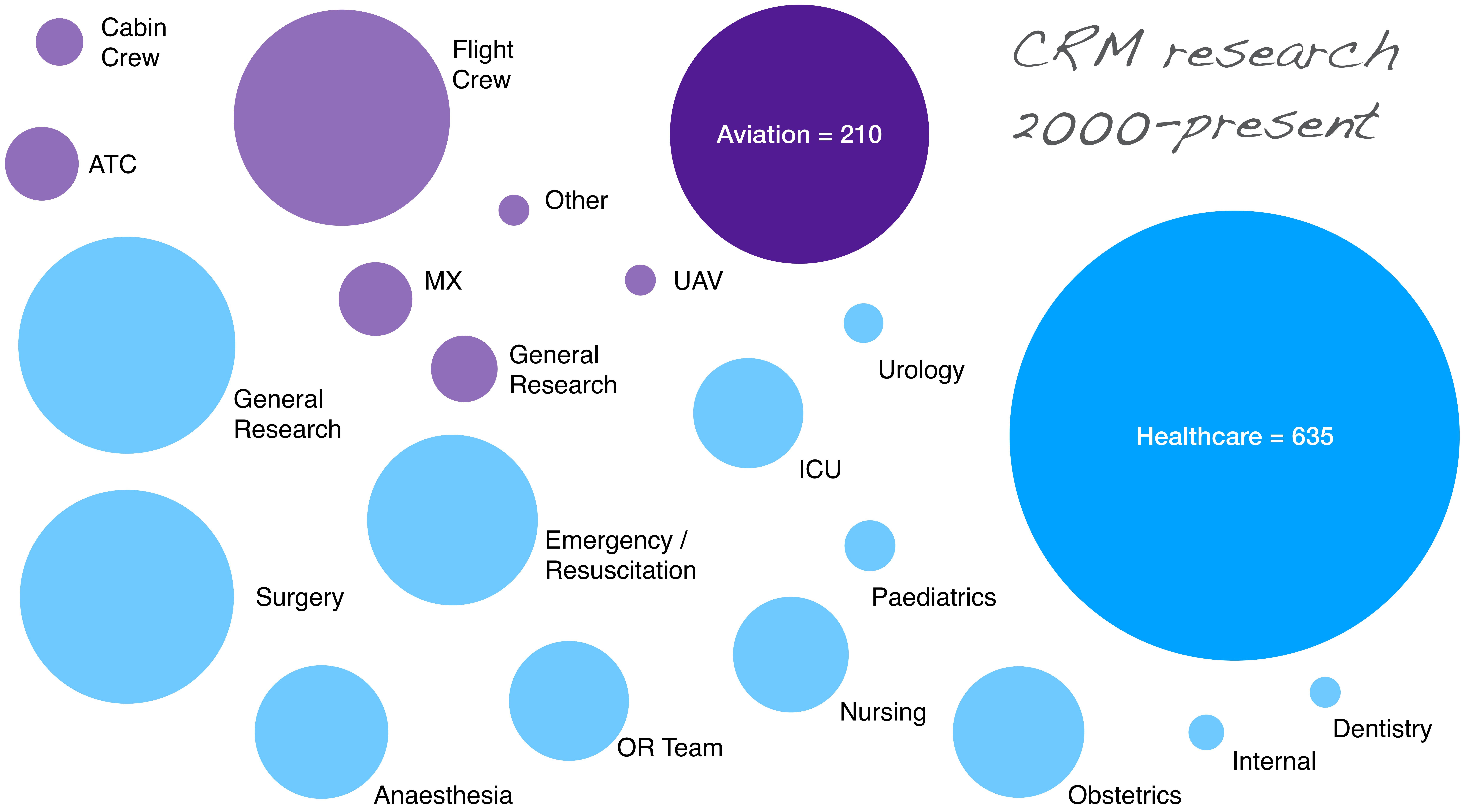
Proactive risk-based training needs analysis

Demonstrating return on investment

Scripting errors into scenarios

Outcome measures to evaluate training programs




CRM research
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Flight Crew
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Other
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ICU
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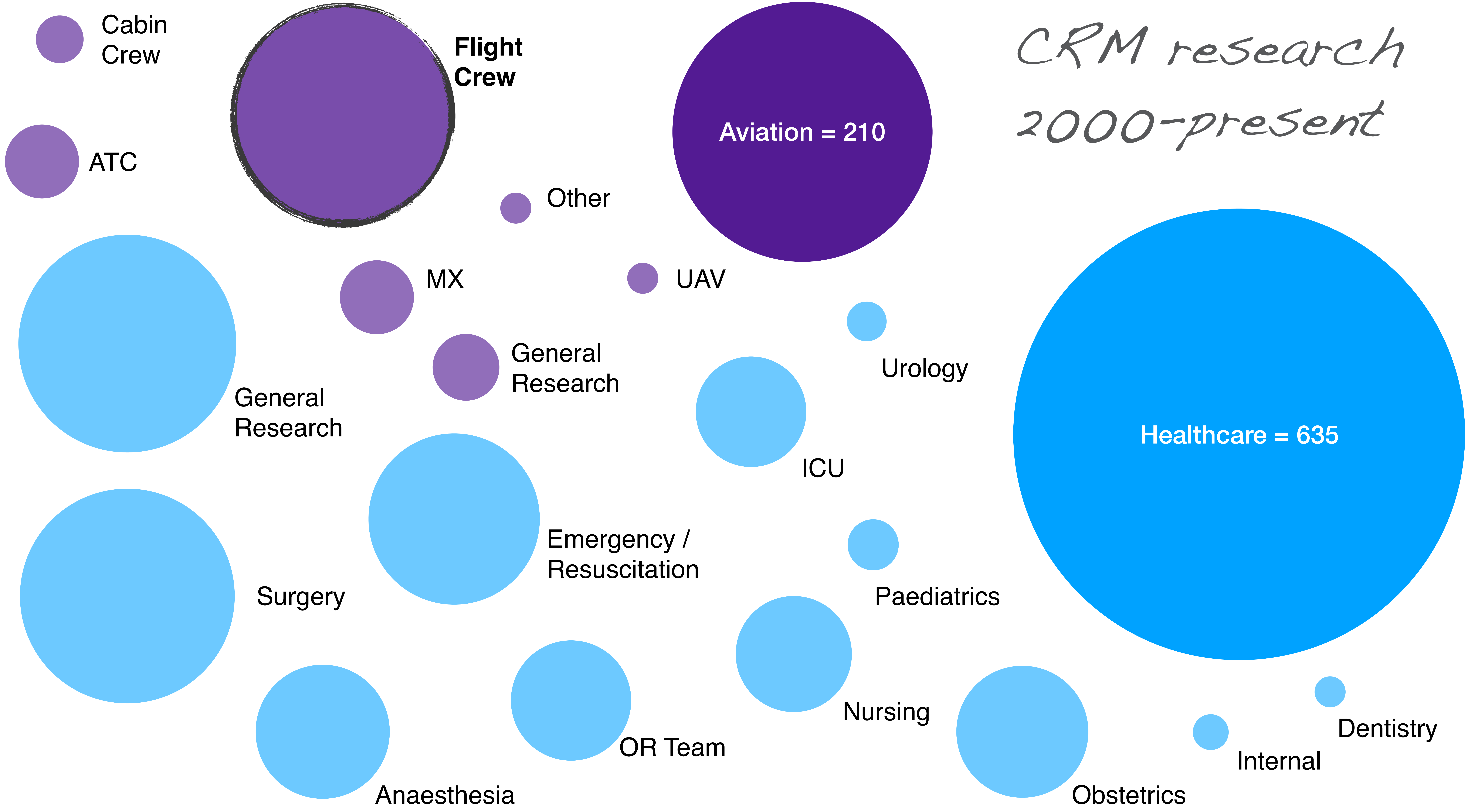
Obstetrics
Internal
Dentistry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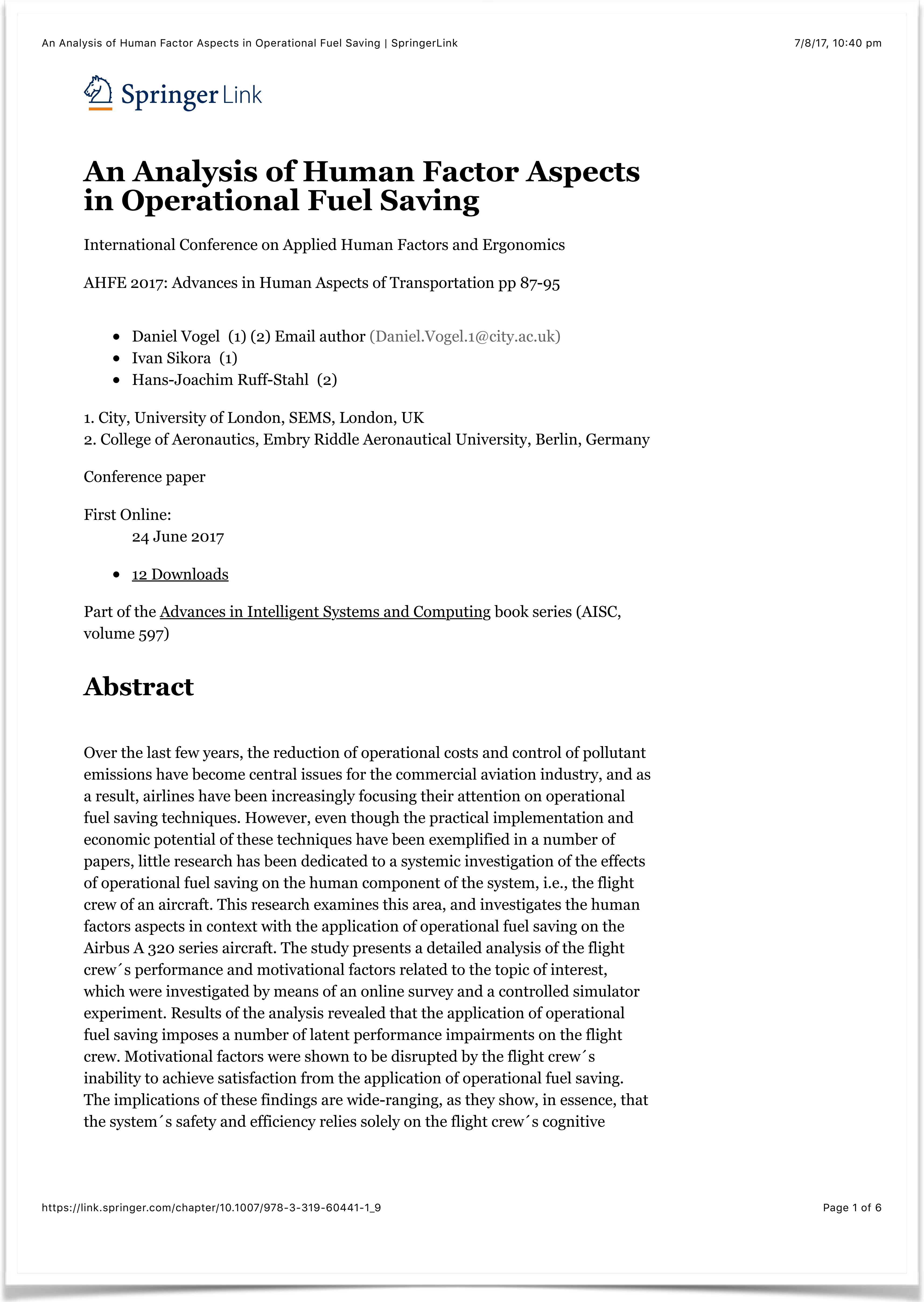
An Analysis of Human Factor Aspects in Operational Fuel Saving



An Analysis of Human Factor Aspects in Operational Fuel Saving

International Conference on Applied Human Factors and Ergonomics

AHFE 2017: Advances in Human Aspects of Transportation pp 87-95

- Daniel Vogel (1) (2) Email author (Daniel.Vogel.1@city.ac.uk)
- Ivan Sikora (1)
- Hans-Joachim Ruff-Stahl (2)

1. City, University of London, SEMS, London, UK
2. College of Aeronautics, Embry Riddle Aeronautical University, Berlin, Germany

Conference paper

First Online:
24 June 2017

- 12 Downloads

Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 597)

Abstract

Over the last few years, the reduction of operational costs and control of pollutant emissions have become central issues for the commercial aviation industry, and as a result, airlines have been increasingly focusing their attention on operational fuel saving techniques. However, even though the practical implementation and economic potential of these techniques have been exemplified in a number of papers, little research has been dedicated to a systemic investigation of the effects of operational fuel saving on the human component of the system, i.e., the flight crew of an aircraft. This research examines this area, and investigates the human factors aspects in context with the application of operational fuel saving on the Airbus A 320 series aircraft. The study presents a detailed analysis of the flight crew´s performance and motivational factors related to the topic of interest, which were investigated by means of an online survey and a controlled simulator experiment. Results of the analysis revealed that the application of operational fuel saving imposes a number of latent performance impairments on the flight crew. Motivational factors were shown to be disrupted by the flight crew´s inability to achieve satisfaction from the application of operational fuel saving. The implications of these findings are wide-ranging, as they show, in essence, that the system´s safety and efficiency relies solely on the flight crew´s cognitive

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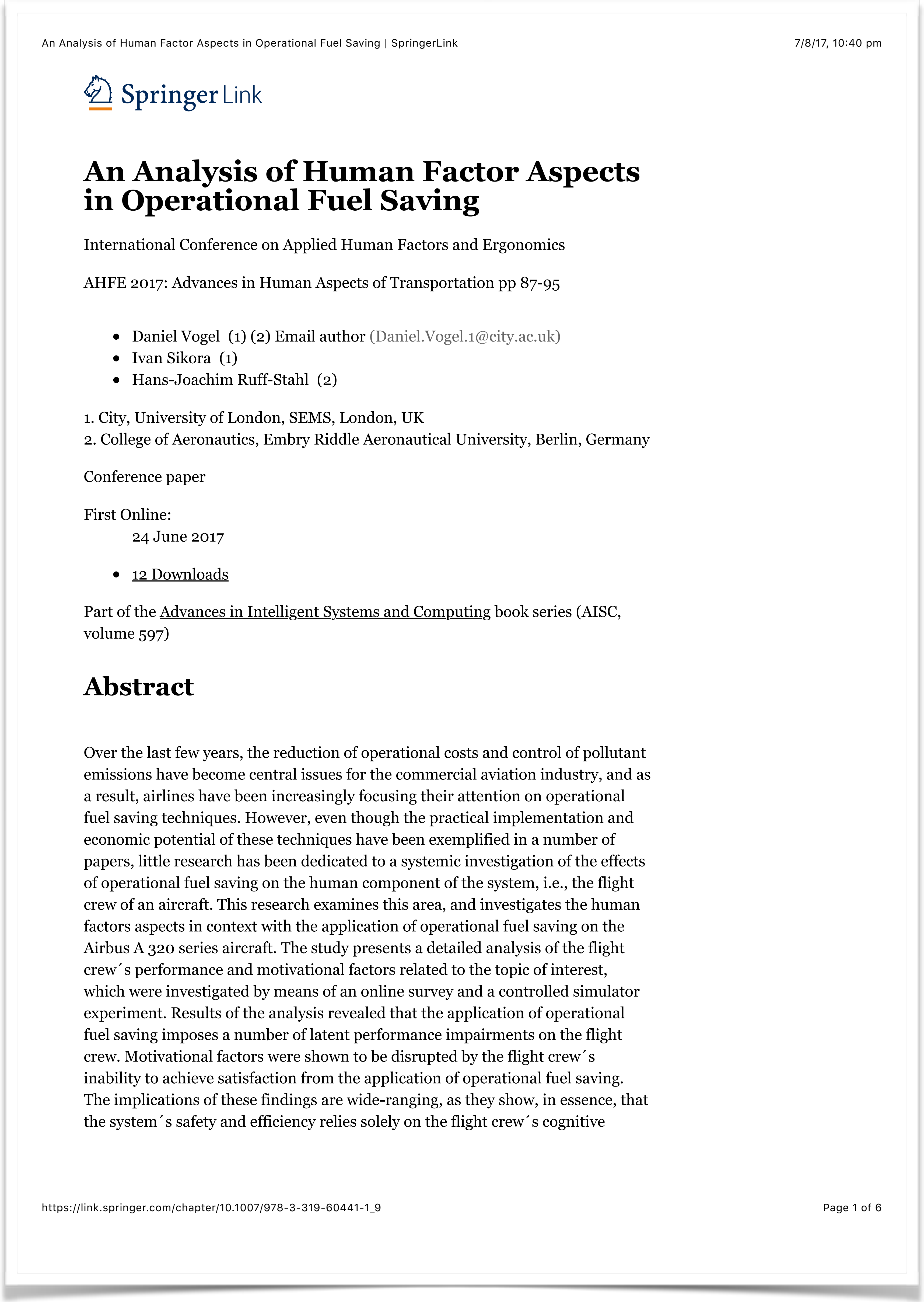

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International Conference on Applied Human Factors and Ergonomics

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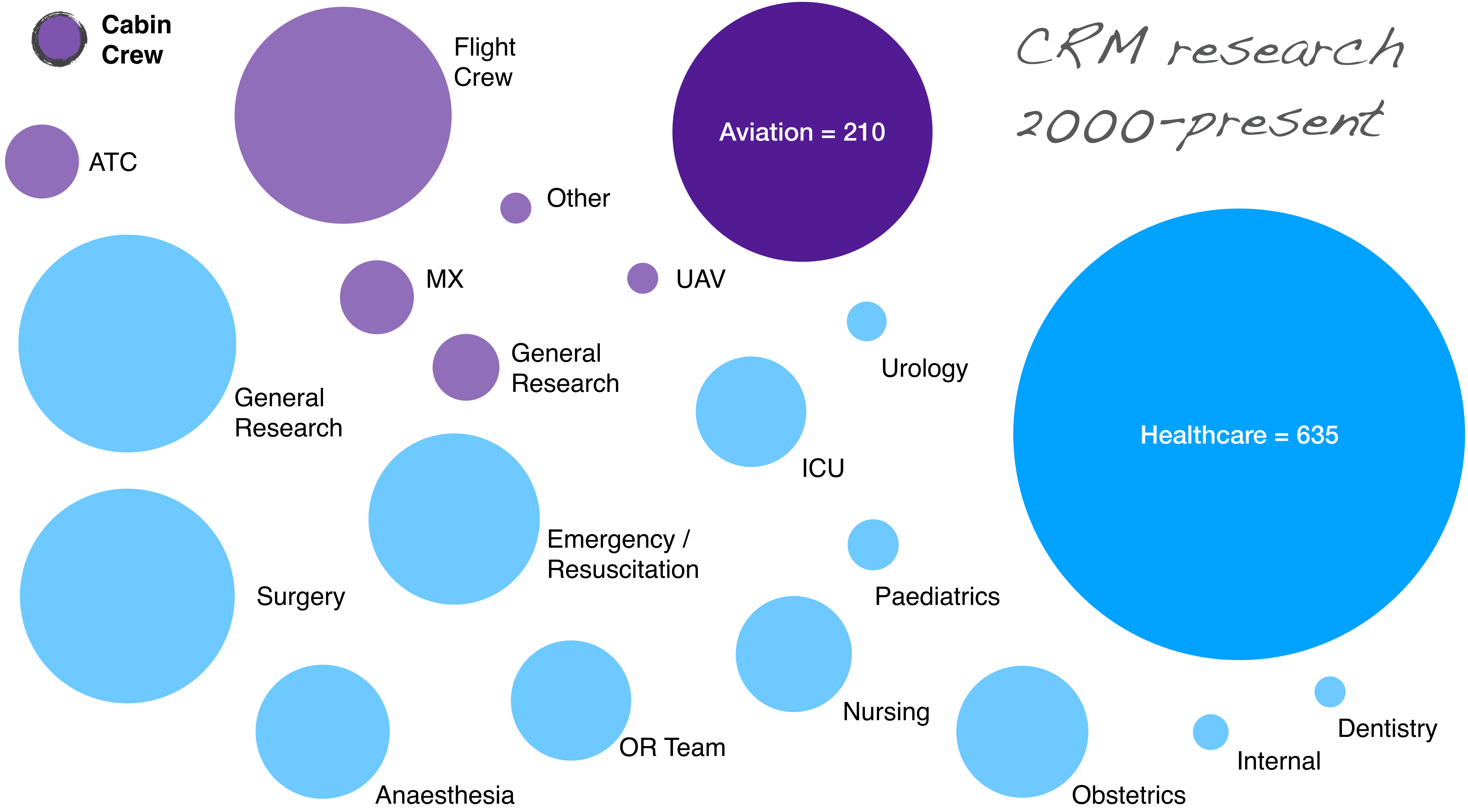
An Analysis of Human Factor Aspects in Operational Fuel Saving

"Motivational factors were shown to be disrupted by the flight crew´s inability to achieve satisfaction from the application of operational fuel saving".

Our fuel policy killed their buzz...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Healthcare = 635
Emergency / Resuscitation
Surgery
Paediatrics
Nursing
OR Team
Anaesthesia
Obstetrics
Internal
Dentistry

Using Comics as a Transfer Support Tool for Crew Resource Management Training

Using Comics as a Transfer Support Tool for Crew Resource Management Training

Sandrina Ritzmann, Annette Kluge & Vera Hagemann
Business and Organizational Psychology, University of Duisburg-Essen, Germany

Transfer of Crew Resource Management (CRM) Training is an important issue when determining the effectiveness of CRM, but factors influencing transfer after training such as supervisor support cannot be easily controlled in the daily work of airline crews. In this study, a comic-based transfer support tool for flight attendants was designed and tested. Nineteen flight attendants received four comics depicting realistic CRM-related incidents following their initial CRM training in regular intervals. The impact of comics on attitudes, knowledge, behavior, self-efficacy (SE), and retrospective perceived usefulness of training was measured and compared against a control group (n = 22). The comic group showed higher values in SE and retrospective usefulness, but lower values in mean attitude toward CRM. Results for knowledge and behavior were not significant. Correlation analyses showed that number of comics read was associated with higher SE, higher values in retrospective usefulness and assertive behavior, better knowledge about the aim of CRM and lower values in attitude toward situation awareness. Comics thus had a positive impact on SE, but higher SE might have caused a shift towards riskier attitudes (Krueger Jr. & Dickson, 1994). Further research is needed to determine the effect of comics on transfer of knowledge and behavior.

INTRODUCTION

More than 30 years ago, the aviation industry realized that human error and team work problems such as failures of command or interpersonal communication were major causes for incidents and accidents (Helmreich, Merritt & Wilhelm, 1999; Flin, O'Connor, & Mearns, 2002). Training programs known as Crew Resource Management (CRM) were developed to address these issues and increase team effectiveness (Helmreich & Foushee, 1993; Salas, Burke, Bowers & Wilson, 2001). CRM has been defined as "the use of all available resources - information, equipment, and people - to achieve safe and efficient flight operations" (Lauber, 1984, p. 20). First targeted at cockpit crews, CRM was extended to other professional groups such as maintenance technicians or flight attendants during the 1990s (Helmreich et al., 1999). Since the early days of CRM, evaluation of the effectiveness of CRM training in aviation has been a priority (Burke, Wilson & Salas, 2005). An important issue concerning training effectiveness is transfer of training: Is training content maintained, applied to the job and adapted to novel situations (Goldstein & Ford, 2002; Baldwin & Ford, 1988)? Empirical evidence indicating whether CRM training is transferred to behavior in actual or simulated job environments is mixed, showing only partial transfer or regression of behavior to pretraining level (Salas, Wilson, Burke & Wightman, 2006).

Factors influencing transfer have been identified in the process model of transfer by Baldwin and Ford (1988), the critical variables being training design, trainee characteristics, and the work environment. Training designed according to approved principles of instruction (see e.g. Merrill, 2002), which ideally takes trainees' characteristics into account, is beneficial for transfer by influencing the initial learning outcome positively. At this stage, the process can be influenced by training designers. However, the work environment is of primary importance after training: A trainee needs opportunities to apply learned skills, a favorable organizational climate and supervisor support (Goldstein & Ford, 2002; Baldwin, Ford, & Blume, 2009) in order to transfer training content into practice. These aspects are difficult to realize for the transfer of non-technical CRM competencies in the aviation context, especially for cockpit and cabin crews. Ethically, safety-critical situations cannot be created just to offer practice, organizational climate cannot be "installed", and supervisors change for every work shift. The goal of the present study is thus to present the design and testing of an on-the-job transfer support tool that is temporally and spatially independent to take into account the irregular work schedules of crews. Also, the tool should be stand-alone in the sense that no further comments of instructors are needed, as this would call for additional train-the-trainer instruction. Additionally, the tool should be designed in a way that is engaging and interesting to motivate its utilization. These characteristics excluded any face-to-face activity and called for a media-based tool suited for the target group in question.

Most CRM research to date has focused on the cockpit crew, leaving the cabin crew an under-researched, but safety critical population. We thus focused on flight attendants as our target group for several reasons. First, cabin crew members have less training time in the simulator, which offers practice of technical and non-technical skills in a realistic, transfer-supporting environment, e.g. in LOFT (Hamman, 2010). Second, the service role of flight attendants is dominant over their safety role, as service duties absorb more working time (Murphy, 2001), therefore their safety role is in need of reinforcement (Bani-Salameh, Abbas, & Bani-Salameh, 2010). Third, a recent analysis of the CRM portfolio of a European airline showed that cabin crews enjoyed their training modules less, rated them as less useful, reported less subjective knowledge gain and a less positive attitude toward CRM compared to pilots (Ritzmann, Kluge, & Hagemann, 2009).

On a continuum of media-based training transfer support tools ranging from pure text to interactive applications, different options were considered and comics finally deemed to be most suitable for the present study with flight attendants for the following reasons: First, the use of comics in

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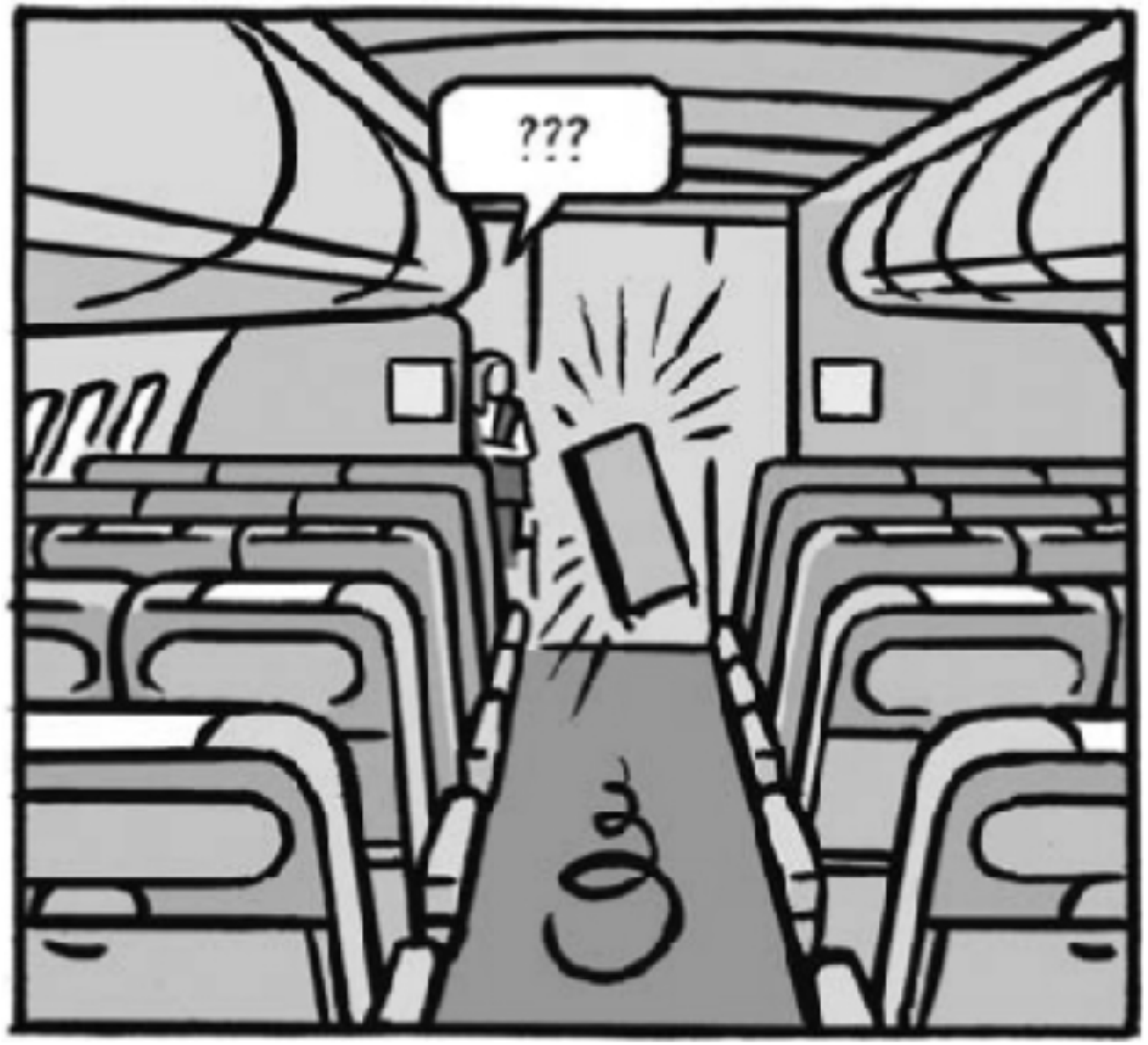

Figure 1. Example of a transfer comic panel

"An example of a panel is given in Fig. 1. It is an extract of an incident that happened on a ferry flight, where a trolley was left unsecured before landing because the flight attendant was distracted. At touch-down, it came out of its compartment, went through the whole cabin and hit the cockpit door."

Using Comics as a Transfer Support Tool for Crew Resource Management Training

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"No effect was found for knowledge or behavioral measures, and contrary to our expectations, the comic group showed a lower overall mean attitude".

Our comic sucked and now they hate CRM...


The future is bright...

After 40 Years of Hot Tub Therapy - The Future is Bright

1. We have created something truly amazing...

2. We now need to look outside aviation for both innovation and best-practice

3. We mustn't be afraid of science...

AAvPA - Upcoming Events

Harnessing Human Factors Data to Enhance Safety Performance

AAvPA One-Day Workshop - September 22 2017 - Vibe Canberra Airport

The safety management system of a modern aviation organisation is often described in terms of adopting a "data-driven" approach to managing risk. Data can take many forms, can be derived from many sources, and is used in a wide range of safety management processes. Data is not necessarily always useful in its raw form, and demands appropriate analysis in order to be used effectively as an indicator of performance, highlight areas of emerging risk, or be used to inform organisational decision-making processes. This workshop will showcase the experiences of a range of aviation organisations in how they have harnessed human factors data to enhance safety performance.

13th International Symposium - PACDEFF 2018

November 2018 - TBC - Sydney

Thank you...

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