Crew Resource Management:
High Reliability Practice for Healthcare

Crew Resource Management was born out of necessity in response to catastrophic fatal accidents in the airline industry in the 1970s. The tradition and culture in the airline industry before the Tenerife airport disaster of 1977 was that the pilot was alone able to perform safe air flight because of his superior technical skill and proficiency. With the increasing complexity of airplanes and air flight, it became apparent that one person could no longer safely handle the flight of an airplane. At the time, accident data revealed that over 65% of airplane accidents were due to the lack of leadership qualities, communication skills, crew coordination and decision-making. Crew Resource Management was created in response to these deficiencies and requires "the effective use of all available resources: human resources, hardware, and information. Other groups routinely working with the cockpit crew [dispatchers, flight attendants, maintenance personnel, and air traffic controllers] who are involved in decisions required to operate a flight safely, are also essential participants in an effective CRM process." (Federal Aviation Administration, Advisory Circular No. 120-51E, Crew Resource Management Training) Crew Resource Management formally began when the National Transportation Safety Board (NTSB) recommended its wide adoption following the December 28, 1978 crash of United Airlines flight 173. The NTSB concluded that "a breakdown in cockpit management and teamwork" during the crew's attention to a landing gear malfunction led to the plane running out of fuel and crash landing. CRM is now applied as a safety-enhancing practice far beyond commercial air travel; firefighting, offshore oil operations, nuclear power plants, theme parks, cargo ships, air traffic control, health care, and other high-risk industries have improved their safety performance with CRM.

Why is CRM an important safety practice?
Crew Resource Management training focuses on improving the entire flight team's decision-making, leadership, communication, stress and fatigue management and teamwork to ensure safe and efficient operations. CRM-trained individuals operate more effectively as teams and respond more effectively to safety threats and non-routine situations. According to Jerry Mulenburg, a former air force pilot and NASA division chief, the basic goal of CRM is to avoid, trap, or mitigate the consequences of errors resulting from poor decisions. "The driving

idea behind CRM is to train aircrews in communication skills to maximize coordination and minimize the chance for errors." (Crew Resource Management Improves Decision Making, Ask Magazine) CRM helps the entire team integrate their knowledge and experience to arrive at a wise and robust decision. Teams use Team Resource Integration Management or TRIM techniques to ensure that the CRM process is carried out effectively:

- Talk with each other
- Respect each other
- Initiate action
- Monitor results

Teams apply the TRIM model to reduce decision errors and the consequence of those errors and to gain and maintain situational awareness. To achieve accurate and robust decisions the team strengthens its interpersonal and behavioral skills to establish better relationships and more effective communication between team members. CRM has contributed significantly toward the prevention of pilot error-related accidents and it has saved airplanes and lives. (AirlineSafety.com)

What are the CRM safe practices?
The primary goal of CRM is to enhance situational awareness, leadership, assertiveness, decision-making, flexibility, adaptability, and communication.

CRM fosters a climate and culture where authority may be respectfully questioned.

CRM practice trains team members to recognize the discrepancy between what is happening and what should be happening – an early indicator that an error may be occurring.

CRM requires the use of appropriate communication techniques so that both supervisors and subordinates understand that the questioning of authority or decisions is not intended to be threatening or disrespectful.

CRM encourages assertive communications when someone wants to express their concern about an emerging safety risk and get the attention of the decision maker.

An effective CRM communication tool is the 5-step assertive statement:
- Open with an attention getter including the person's name
- State your concern including a brief analysis of the situation in a direct manner
- State the problem as you see it
- State your proposed solution to the problem
- Obtain agreement or buy-in to the solution

The Federal Aviation Administration's Crew Resource Management Training Advisory (January 22, 2004) identifies the following characteristics of an effective CRM training program:

- CRM is a comprehensive system of applying human factors concepts to improve crew performance
- CRM embraces all operational personnel
- CRM focuses on crew member attitudes and behaviors and their impact on safety
- CRM uses the crew as the unit of training
- CRM requires the active participation of all crew members
- CRM provides individual crew members with an opportunity to examine their own behavior and to make suggestion on how to improve teamwork
- CRM training is enhanced through simulation training which provides an effective means of practicing CRM skills and receiving feedback during the debriefing process – teams can also participate in group problem-solving practice sessions where they can critique the positive and negative behaviors of all team members.

How is CRM training implemented?
- Conduct an initial orientation session to review the safety benefits of improved communication, decision-making, interpersonal relations, crew coordination, leadership, and adherence to policies and practices.
- Conduct recurrent training sessions that include classroom education, practice and feedback exercises, simulation, and role-playing with the entire crew (team).
- Curriculum #1 – focuses on improving communications by first identifying and resolving communication barriers and examining other factors such as organizational culture and the need for improved clarity of policies and

procedures that impede effective communication among team members. Additionally, training focuses on improving speaking skills, listening skills, decision-making skills, assertive communication, and conflict resolution techniques.

- Curriculum #2 – the captain (or team leader) is trained to conduct a pre-flight (pre-procedure) briefing to address operational issues, interpersonal issues, encouragement to maintain open communications, reminder to use clear and unambiguous communication, reaffirm the procedures to be implemented, and address any potential safety situations that might be anticipated.
- Curriculum #3 – to reinforce effective human factors practices, team members are trained to use self-critique through debriefing to assess their performance and to be able to recognize good and bad communications and the difference between effective and ineffective team behaviors.
- Curriculum #4 – team members are trained to maintain open communication when dealing with conflict, use techniques to effectively resolve disagreements among team members, interpret information, and propose new courses of action.
- Curriculum #5 – team members learn to make good decision choices in situations when the information is incomplete or contradictory.
- Curriculum #6 – interpersonal relationships and effective leadership and fellowship are essential to safe practice – teams learn to effectively work together despite differences in rank, personality, and roles. Individuals learn how to maintain the proper balance between respecting authority and practicing assertiveness. Teams learn to maintain a friendly, relaxed, and supportive yet task-oriented atmosphere in the work environment.
- Curriculum #7 – teams learn the habits of situational awareness and how to maintain continuous awareness of the operational environment and a focus on anticipating and identifying contingencies. Situational awareness involves constant vigilance, time and workload management, and avoiding distractions.
- Curriculum #8 – Stress and fatigue can have a negative effect on individual cognitive functions and team performance. The effectiveness of interpersonal communications skills become even more important under stressful conditions. Teams must learn appropriate counter-measures for coping with stressors.

Crew monitoring and cross-checking – several studies reviewing airline incidents and accidents have identified flight crew monitoring and cross-checking as important contributors to airline safety. Each crew member must actively monitor the aircraft's flight path and systems and cross-check the actions of other crew members. "Effective monitoring and cross-checking can be the last line of defense that prevents an accident because detecting an error or unsafe situation may break the chain of events leading to an accident." (FAA Crew Resource Management Advisory 120-51E)

There are many advantages of applying the safe practices of Crew Resource Management to the care of patients. Through improved communication, teamwork, situational awareness, and an assertive questioning attitude, patient care teams will be better prepared to deliver harm-free healthcare.

Prepared by
Chuck Mowll, MPH, LFACHE
President and CEO
Patient Safety Coaches Academy, LLC

Patientsafetycoach.com