Basis and Implementation of Trusted Care across the U.S. Air Force Medical Services

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Key Words: Air Force, Trusted Care, Military Healthcare**,** Change Management, High Reliability

Abstract

The Air Force Medical Services (AFMS) health system is a global enterprise tasked with caring for thousands of Service members and their families. In an effort to improve its ability to effectively accomplish its mission, the AFMS has launched out on a high reliability-driven journey, named Trusted Care, that aims to improve safety, reliability, and resilience by enhancing the culture of front line staff, intermediate leaders, senior leaders, and others in delivery of preventative medicine and healthcare. In the study we: (1) describe the AFMS approach to achieving high reliability and (2) present preliminary findings from survey data obtained from AFMS personnel that participated in the Trusted Care implementation process. Descriptive analysis of that data suggests that, although the majority of respondents supported and utilized some of the available Trusted Care tools and resources (e.g., Huddles and CPI Management Boards), internet-based tools (e.g., social media) were not as well embraced to date. In support of achieving high reliability, a majority of stakeholders reported that they are actively engaged in the change management approach and feel comfortable and secure elevating concerns suggesting that the Trusted Care approach has instituted steps necessary to creating a psychologically safe culture across the AFMS. Furthermore, there was acceptance and application of the change management approaches with stakeholder feedback suggesting that recommendations at the front line are being acted upon and implemented. The net outcome of these findings indicate that, although the AFMS is maturing as a high reliability culture, there areas that require continued attention and improvement in the Trusted Care approach.

Introduction

The term “military health” conjures images of a combat medic delivering urgent care to wounded Soldiers or Airmen while dodging bullets and mortar explosions during the heat of battle. In fact, combat medicine is one of the many components of the U.S. Military Health System (MHS)—a vast network of 54 hospitals, 377 clinics, and 270 dental facilities that provides care to 9.5 million active duty, Reserve, National Guard, Veterans, and their families.[1] During fiscal year 2018, the MHS had more than 1,005,700 inpatient and 106,100,000 outpatient visits.[1] Within the MHS, each branch of the Department of Defense (DoD) oversees the treatment of its respective Service members and families. Within the Air Force, the Air Force Medical Service (AFMS) provides medical care, with a mission to “ensure medically fit forces, provide expeditionary medics, and deliver Trusted Care to all we serve.”[2] The AFMS oversees more than 70 military treatment facilities (MTF) in the continental U.S. and seven countries across the world, four Aeromedical Evacuation units, and multiple deployed medical units. The AFMS is “comprised of nearly 60,000 active duty, Reserve, Guard, civilian, and contract medical and support professionals who are responsible for the care of more than 2.6 million patients.”[3] However, the DoD is presently undergoing an organizational transition where the oversight (i.e., administration, direction, and control) of MTFs is being transitioned to the Defense Health Agency (DHA). With the vastness of the MHS and the ongoing Defense Health Agency transition and Air Force Medical Service transformation, it is more important than ever that we continue to have a “single minded” focus on safety and Zero Harm or the patient will be the one who suffers in the way of harm events. Many factors contribute to the AFMS’ ability to provide quality care, but a key element is a commitment to high reliability.

Medical errors or accidents can have serious ramifications. As Runciman et al. noted, errors can result from "doing the wrong thing (commission) or by failing to do the right thing (omission)."[4] The AFMS' commitment to high reliability operations will identify sources of errors and take steps to minimize and/or eliminate their occurrence. In practical terms, the AFMS achieves this by encouraging good communication between front line staff and leadership[5] that requires a solid, informed commitment from all individuals in the organization.

In general, this study examines the gold-standard organizational change management theories that the AFMS leveraged as the basis, or groundwork, to creating a high reliability culture necessary for maturing as a "high reliability organization" (HRO).[6-9] An HRO is comprised of culture, standardized processes/standard work and the associated training, and specially designed systems. Specifically, this study analyzes the methodical basis and implementation of HRO practices and principles across the AFMS:

- We introduce and review the concept of HROs, provide an overview of the Trusted Care concept in the AFMS as defined in the Trusted Care Concept of Operations (CONOPS)[10] and describe several models of change management.
- We describe the methods and outcomes of a campaign that promoted change management in the AFMS.
- We present results and discuss the outcomes in the context of present-day AFMS practices and highlight similarities and differences between the AFMS and other HROs.

High Reliability Organizations and Healthcare

HROs are "organizations that have the potential for catastrophic failure yet engage in nearly error-free performance."[8] HROs maximize resilience by confronting and preparing for

problems and incorporate strategies such as focusing on the potential for operational failure, avoiding oversimplifying problems, and consulting with experts when the need arises.[11] Current thoughts about HROs is attributed to research by Weick, Sutcliffe, and Obsterfeld, who examined industries that are at risk for catastrophic failure yet perform without major failure, such as aircraft carriers and nuclear power plants. One of the main reasons for the success in these organizations is that all personnel demonstrated behaviors consistent with key high reliability principles.[11-12]

In the context of healthcare, high reliability entails meeting the demands of patients and customers while maintaining operations and remaining vigilant of the potential for problems.[13] Healthcare accomplishes this goal by preventing harm and employing continuous process improvement. Interest in HROs in healthcare dates back to a 1999 report ("To Err is Human") on the state of safety in American healthcare by the Institute of Medicine (now The Health and Medicine Division of the National Academy of Sciences).[14] The report identified different types and causes of safety errors in healthcare facilities, described then-current reporting systems, and provided a roadmap for improving reporting conditions. The report had a critical effect on the healthcare industry and inspired an entire field of research on improving patient safety.

A little over a decade later, Chassin and Loeb published their high-reliability healthcare maturity model of change management.[15] The thrust of this model was that effective changes in safety occur incrementally rather than rapidly. More importantly, they also postulated that all levels of the organization must participate in the changes, from the front line staff to leadership.

Harm events documented in the MHS' Patient Safety Reporting System and retrieved in 2014[16] indicated that errors negatively impacted healthcare delivery and the operational

readiness of Service members. This finding was one of many from the MHS 90-Day Review,[16] that focused on the access to and safety and quality of care provided to all DoD beneficiaries. The study concluded that the best way to improve healthcare safety, quality, and access was for the MHS to mature as an HRO and, as such, was the catalyst for AFMS initiating action.

Trusted Care is the termed phrase for AFMS journey to learning, growing, and maturing as an HRO. The vision of Trusted Care is to transform the AFMS into "a continuous learning and improving organization, who partners with our patients and families, with a single-minded focus of safety and Zero Harm" (i.e., eliminating avoidable safety events and associated ramifications).[3] This study evaluates AFMS approach to implement these practices designed to allow Airmen to tackle daily challenges and embody the Trusted Care culture. Future studies will examine the correlation of Trusted Care implementation with patient safety indicators and outcomes.

Basis of Trusted Care Implementation: Change Management Techniques

Change management is a systematic, structured practice to introduce, embed, and transform new practices and perspectives into an organization. The length of time for a completed transformation varies between organizations and the scope of the project.[17] Change management has many different approaches. The AFMS selected key components of established transformation and gold-standard change management models to create a unique, specific approach to their culture change. Drs. Weick and Sutcliffe developed the five foundational principles of performance management in HROs[11] and are the methodological basis of Trusted Care. These principles were integrated with selected aspects of the Shingo Model[18] and Kotter's

8-Step Model of Change,[19] as well as novel elements reflecting the inherent uniqueness of the MHS to develop and implement Trusted Care.

The five principles developed by Weick and Sutcliffe were based on observations of collective mindfulness and enactment within organizations at high risk for failure. Essentially, Weick and Sutcliffe believe that planning for the unexpected does the opposite of what is intended because planning occurs in a normal, stable environment and does not allow for "unexpected events that fall outside the realm of planning."[11] The principles focus on an HROs ability to anticipate the unexpected (track small failures; resist oversimplification; remain sensitive to operations) and the capacity to contain them once they occur (maintain capabilities for resilience; take advantage of shifting locations of enterprise).[11]

The Shingo Model is an "approach to improve work processes by embedding principles of excellence into organizational culture."[20] This puts an organization's focus on value in the eye of the customer and high quality in all they do (i.e., making high quality a habit). The Shingo Model consists of four principle categories that build upon each other. The categories are cultural enablers, continuous process improvement, enterprise alignment, and results. The AFMS Change Management Plan tailored the Shingo Model by focusing on process improvement and embedding the Air Force Core Values as the Trusted Care foundation.[21] The Trusted Care Principles echo this model (Table 1).

Table 1. Air Force Core Values, Shingo, and Weick and Sutcliffe Principles Aligned to the Trusted Care Principles

Air Force Core Values and Trusted Care Foundation		
• Integrity First • Service Before Self • Excellence in All We Do		
Weick and Sutcliffe Principles	**Shingo Principles**	**Trusted Care Principles**

1. Preoccupation with Failure 2. Reluctance to Simplify Interpretations 3. Sensitivity to Operations 4. Commitment to Resilience 5. Deference to Expertise	1. Cultural Enablers: • Respect Every Individual • Lead with Humility 2. Process Improvement: • Flow and Pull Value • Assure Quality at the Source • Focus on the Process • Embrace Scientific Thinking • Seek Perfection 3. Enterprise Alignment: • Create Consistency of Purpose • Think Systematically 4. Results: • Create Value for the Customer	• Respect for People • Duty to Speak Up • Commitment to Resilience • Focus on Front Line Operations and the People Who Do the Work • Every Airman, Every Day, A Problem Solver • Constancy of Purpose • Systems Thinking • Zero Harm • Maximize Value to The Patient

Kotter's 8-step Model of Change[19] is based on understanding and accepting behaviors associated with the Change Adoption Curve, the four stages most people go through as they adjust to change. The four stages are awareness, understanding, acceptance, and adoption. The eight steps of Kotter's model outline step-by-step guidance, focusing on individual change as a methodology for effective change management.

Kotter's model provided the framework for the AFMS' unique change management communications strategy and the design and focus of its specific messages. Aligning the AFMS' Trusted Care vision with Kotter's 8-Step model allowed leaders to convey the change objectives and provide the necessary resources to engage individuals in the organization at all levels in an effective, actionable change communication approach.

A crosswalk of the Trusted Care change approach to key components of the Kotter's 8-Step model is summarized in Table 2.

Table 2. Crosswalk of Trusted Care Focus Areas and Key Components of Kotter Management Models

	Trusted Care Focus Areas		
Trusted Care Management Approach	• Lead and Build Awareness	• Anchor and Embed	• Manage and Measure
John Kotter's 8-Step Approach	• Create a Sense of Urgency • Build a Guiding Coalition • Form a Strategic Vision and Initiatives	• Enlist a Volunteer Army • Enable Action by Removing Barriers	• Generate Short Term Wins • Sustain Acceleration • Institute Change

These primary models, well grounded in widely accepted literature, formed the methodical and evidence-basis of the AFMS Trusted Care approach. This study analyzes the implementation of HRO principles across the AFMS by tracking the implementation of key components of these models. This study also explores the factors influencing HRO outcomes and compares AFMS' journey to other organizations' HRO approaches.

Methods

Approach to Implementation

The Trusted Care methodology guided the development of a Change Management Plan. The approach to implementation centered on the leader engagement domain of change. The objectives were: (1) Senior Leader Engagement, (2) Education and Training, and (3) Marketing and Communication. There were three supporting execution plans:

- A Safety and Reliability Rollout (S&RR) Plan, that outlined a comprehensive improvement plan implemented in three phases,
- A Change Management and Communications Plan, that ensured that all members across the AFMS enterprise were aware of the Trusted Care strategy, its importance, how they might be impacted, and how their role supported it, and
- The AFMS Leader Learning Continuum Model, in which Trusted Care competencies and behaviors and courses and associated materials were developed and adjusted to ensure proper alignment to Trusted Care behaviors.

The following sections provide details on the training and outreach tools and tactics that moved all entities within the organization (e.g., support personnel, technicians, nurses, doctors, and leaders) through the process of change adoption over time—from early awareness of the efforts, to adoption of HRO behaviors, and to full ownership of all principles of Trusted Care.

Safety and Reliability Rollout (S&RR) Plan

An overview of the progression of phases in the S&RR can be seen in Table 3. In the first phase of this rollout, the AFMS completed in-person diagnostic assessments to create facility-specific plans to help leaders implement high reliability practices across all MTFs. These visits included gathering data, reviewing safety events, analyzing common causes of events, and

training leadership on evidence-based tools to foster a safe and reliable culture. From these visits, the Air Force Medical Operations Agency (AFMOA) and other stakeholders developed concise cohort- and facility-specific sustainment plans to prepare MTF leadership and staff to uphold Trusted Care. AFMOA also worked with MTFs to evaluate the leadership training and engagement strategies, modify the Trusted Care implementation efforts as necessary, and refine the program for application to other MTFs.

Table 3: Overview of the S&RR Rollout Phases

Phase	Details
1. Diagnostics January 2017–September 2017	Data gathering and analysis of safety events, common cause analysis, and leadership training, evidence-based tools to lead a safe and reliable culture
2. Implementation September 2017–May 2018	Continuing communication, education, and assessment
3. Sustainment November 2017–ongoing	Visits to MTFs, monthly Virtual Coaching calls, leader methods refreshers, error prevention boosters, open forum discussions, and gamification training

Monthly Virtual Coaching Calls supplemented the visits, providing announcements, leader method refreshers, error prevention boosters, and open forum discussion. Gamification activities reinforced the Safety Behaviors and Error Prevention Tools (SB/EPT; HPI/Press Ganey Associates, Inc., South Bend, IN), including a Trusted Care: Hero for Zero mobile application and the Leaderboard Competition. It should be noted, although the data for the Hero for Zero application and Leaderboard Competition are reported as separate items, The Leaderboard Competition was designed as an extension of the Hero for Zero application to increase leadership involvement.

Safety & Reliability Training (S&RT) was developed to be a front line level training bridge until the Trusted Care Leader Learning Continuum/Competencies-Behaviors could be

built and appropriate adjustments made in course curricula for sustainment of Trusted Care education and training throughout an Airman's career. The AFMS applied instructional system design methods and leading practices to develop a Trusted Care Leadership Competency Model that defined the knowledge, skills, abilities, and behaviors needed to progress from leading oneself to leading others in Trusted Care. The curriculum addressed competencies in Officer Force Development courses, including:

(1) *New*: Quest for Zero entry-level Trusted Care training and board game for new accessions,

(2) *New*: Basic Leadership Airman Skills Training (BLAST) for new flight commanders/chiefs and medical directors (middle management),

(3) *Revised Curriculum*: Intermediate Executive Skills (IES) for new positions (e.g., Squadron Commanders, Squadron Superintendents, Functional Area Managers) across the AFMS (Director Level Management),

(4) *Revised Curriculum*: Combined Senior Leadership Course (CSLC), for new O-6 and E-9 and GS-14/15s positions (e.g., Colonel and Chief Master Sargent; Executive leadership members; C-Suite level),

(5) *Revised Curriculum*: Tier II Commander courses for first-time Medical Group Commanders and second-time Commanders who will lead Tier I hospitals and medical centers (CEO level),

(6) *New*: Tier I Commander courses for first-time Medical Group Commanders and second-time Commanders who will lead Tier I hospitals and medical centers (CEO level).

Change Management and Communications Plan

The adoption of change happens at the speed of an individual's readiness.[22] Pettigrew and Whipp describe one of the main challenges in change management as "...the ability to manage a series of interrelated and emergent changes (often in parallel and in sequence) is vital."[23] Researchers have also suggested that multiple change processes can lead to change fatigue.[24] Successful implementation of one particular change initiative may harm subsequent change initiatives. If changes are implemented but employees view the process as unfair, they may be reluctant to embrace a new change process. The change capacity that contributed to one particular change effort must then be viewed as temporary. Multiple change processes may also contribute in creating sustainable change capacity. Employees that have experienced positive experiences of change are likely to be more receptive to change. Moreover, managers may transfer experience from one change process to another and thereby develop change management skills.[25]

The Change Management and Communications Plan addressed individual readiness by maximizing the understanding, willingness, and ability of Airmen to move the AFMS toward maturing as an HRO. This was critical because job burnout had been attributed to lower staff health, increased staff turnover, more frequent medical errors, and lower quality and patient satisfaction.[26]

An AFMS Trusted Care Change Champion Network forming a construct known in the industry as a "guiding coalition"[10] advocated for the Trusted Care vision and drove change management activities across the enterprise. The AFMS equipped champions at multiple levels of leadership with the tools to brief Trusted Care to various audiences. In addition, several Safety Science education engagements informed AFMS senior leaders of safety science principles.

The communications elements of the Change Management and Communications Plan drove the messaging, tactics, and timelines of communication and supported ongoing change management efforts with a sequence of safety success stories, safety alerts, and lessons learned across the MTFs. Communications products ranged from print, web, and awareness campaigns, as outlined in the table below. These campaign tools and methods were embedded into the AFMS' daily work and included in the AFMS onboarding orientation training curricula. Table 4 provides details on selected Trusted Care communication products.

Table 4: Trusted Care Communication Product Details

Communication Element	Description
Trusted Care Bulletin	Published monthly and disseminated to the AFMS enterprise to provide staff with: • Regular updates about Trusted Care activities and initiatives • Reminders of dates for upcoming virtual coaching opportunities and developments within each of the Trusted Care Domain
Theme of the Month	• Provided Trusted Care communication topics to stakeholders • Encouraged dialogue regarding Trusted Care principles and domains of high reliability
Posters	Six sets were produced and distributed in the Trusted Care Toolkit and made available for download on the internal share website to increase understanding and connection to Trusted Care
Two Awareness Campaigns	Storytelling has great value in managing change and transformation by illustrating the importance of an initiative, sharing information, and providing the rationale for critical organizational change decisions."[15] These campaigns provided leaders with the tools to structure their stories and the means to share them • "What's Your Why" (WYW) conducted June–December 2017 o Staff engagement campaign focused on gaining AFMS buy in on "why" they should participate in Trusted Care o Staff sent in self-created videos explaining why HRO is important and why they incorporate Trusted Care behaviors into their daily work • "How Do You C.A.R.E?" (HDYC) conducted June–December 2018

Communication Element	Description
	o Highlighted safety behaviors and error prevention tools called C.A.R.E. (Clear Communication, Attention to Detail, Respectful Teamwork and Exercise a Questioning Attitude) o Embedded C.A.R.E. behaviors and tools into the AFMS culture o Increased understanding and application of the C.A.R.E.
Videos	Produced for the Theme of the Month series and for the WYW Campaign. The videos were available for viewing and download from social media
C.A.R.E. Badges (HPI/Press Ganey Associates, Inc., South Bend, IN)	Designed to reinforce expectations to use Trusted Care Safety Behaviors and Error Prevention Tools 50,000 badge cards inscribed with "Ask me about Trusted Care" were distributed to all MTF staff

Data Collection and Analysis

Multiple mechanisms gathered data to enable analysis of the progress and status of the Trusted Care transformation. Throughout 2018, metrics monitored the effectiveness of the websites. In March 2019, the AFMS Annual Pulse Check addressed the effectiveness and utilization of Trusted Care.

One metric was online surveys or "Pulse Checks." The Pulse Check used a five-point Likert questionnaire and moderated conversations (i.e., sessions) with open-ended and closed questions to gather data about the adoption of Trusted Care principles, behaviors, and tools within the AFMS culture and identified opportunities for improvement. Responses were obtained from 344 questionnaires and 24 sessions given by AFMS staff members over the course of two weeks. Participant data were collected and segmented by leadership level (e.g., senior leaders, intermediate leaders, front line) to ensure feedback reflected the broad range of AFMS staff.

It should be noted that in addition to asking about change management, several items in the Pulse Check queried respondents about use of or participation in change management-related items and behaviors. One example of this is CPI (Continuous Process Improvement)* Management boards, organized visual tools that facilitate connecting front line staff to one another and front line leaders and promote problem solving of local issues. Another example is "Huddles," brief daily safety meetings where front line staff can raise and disseminate useful information and problems. Finally, "rounding" refers to the time of day when leaders interact with front line staff.

Pulse Checks were conducted using Microsoft (MS) Forms that provided overall statistical results for the multiple choice and Likert scale responses. Statistical analysis of questionnaire responses was performed using MS Excel and a qualitative analysis of data-mined and coded open-ended responses. Data were exported to MS Excel to filter the responses by participant leadership level and manually calculate response percentages by level with the =SUBTOTAL macro.

The descriptive statistics tool in MS Excel was used to calculate the mean and standard deviation of responses on the Likert scale questions. MS Excel was also used to manually mine data and code responses, including the open-ended questionnaire and feedback session questions, by theme (e.g., leadership engagement, communication) to facilitate the qualitative analysis and

*Although the boards are formally known as "CPI Daily Management Boards" we will refer to them hereafter as "CPI Management Boards".

organization of all open-ended feedback. Responses were grouped into primary, secondary, and tertiary themes.

The open-ended feedback was then categorized by “driver” and “barrier” to analyze what caused respondents to like or dislike a certain aspect of Trusted Care. Key takeaways of each specific aspect (e.g., Huddles, communication, recognition processes) were based on a combination of the statistical and open-ended findings. The results of both the quantitative and qualitative descriptive analysis in this study identified overarching key takeaways, root causes to pertinent issues, and opportunities for improvement in the implementation of Trusted Care.

Results

Please note that the number of responses to items may be unequal due to lost, missing, or otherwise incomplete data collection (e.g., participants did not complete the questionnaire). Questionnaires were disseminated to all organizational inboxes to reach the broadest population possible; respondents were not targeted and they responded at random.

Results of the 2019 Trusted Care Pulse Check Questionnaire

Respondent Demographics

Table 5 displays the service status and role of the respondents. Of the 332 respondents, the majority were active duty (86.75%).

Table 5. Number of Respondents by Role and Service Status

Role	Service Status*		
	AD	R	NR
Front Line (i.e., Technician, Provider, Nurse, Flight Commander, Patient Safety Manager, Administrator)	210	1	34
Intermediate Leader (e.g., Chief, Director, Squadron Commander, Flight leader, Functional Area Managers, or Squadron Superintendent)	50		1
Senior Leader (i.e., MAJCOM SG, Wing Commander, Med Group Commander, Med Group Deputy Commander, Med Group Superintendent)	20		2
Multiple (e.g., medical director or utilization manager and front line)	2		
Master Safety Certifier	1		
Non-patient care (e.g., admin, information technology, code and compliance editor, or maintenance)	4		1
Anonymous	1		
Contractor			1
Education and Training (e.g., Staff Development specialist or credentialing)			2
None of the above			1
Tri-Service Asset			1
TOTAL	288	1	43

**AD = Active Duty, R = Air Force Reserve, NR = No Response*

The three largest groups of respondents by role were Front Line (73.79%), Intermediate Leaders (15.36%), and Senior Leaders (6.63%). The majority of respondents, 78.26%, were located at Air Force-administered MTFs, 21.12% at DHA-administered MTF's, and 0.62% were either located at Air Evacuation Units or Deployed.

Responses on the Pulse Check Survey

Table 6 presents response percentages (n = 344) for the multiple response items on the Pulse Check survey.

Table 6: Percentage of Responses to Multiple Response Items from Pulse Check Survey

Question	**Percentages by Response Option**					
1. How would you rate your familiarity and engagement with Trusted Care?	Familiar	Familiar and somewhat engaged	Not familiar	Somewhat familiar	Very familiar and actively engaged	
	16.86%	28.49%	0.58%	4.94%	49.13%	
2. In your opinion what is the purpose, goal, or vision of Trusted Care?	DHA transition	Innovation	Not sure	Patient centeredness	Readiness	Zero Harm
	0.29%	0.29%	0.58%	11.63%	0.58%	86.63%
3. How would you rate your leadership's involvement with Trusted Care?	Involved	Not involved	Somewhat involved	Very involved		
	34.30%	4.65%	18.02%	43.02%		

For the first question, the optimal response was "Very familiar and actively engaged." Among the 169 respondents that selected this, the responses by role were Front Line (58.58%), Intermediate Leadership (20.12%), Senior Leadership (11.24%), and Others (10.06%).

For the second question, the optimal response was “Zero Harm.” Among the 298 respondents who selected this response, the responses by role were Front Line (67.11%), Intermediate Leadership (16.11%), Senior Leadership (6.71%), and Others (6.69%).

Figure 1 presents the percentage of responses by role to the third question, “How would you rate your leadership’s involvement in Trusted Care?” Error bars are percentage error. This differs from Table 7 in that it stratifies responses based on specific tools rather than overall involvement by roles.

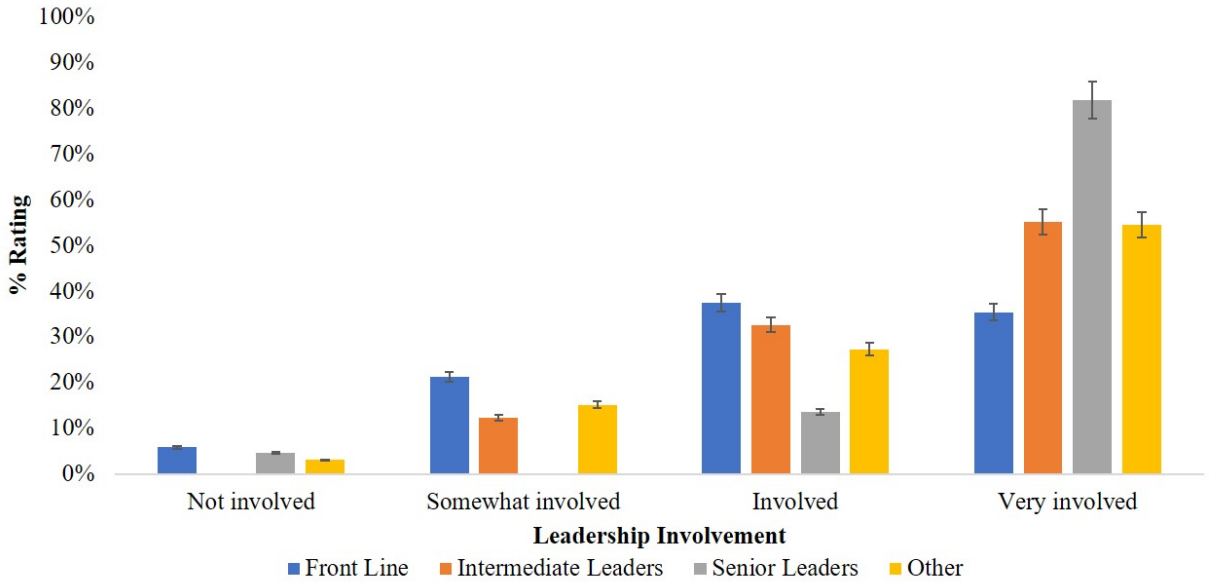

Figure 1. Percentage of Responses by Role to Question 3

Survey respondents also rated the effectiveness of the Trusted Care tools, reported as percentages in Table 7.

Table 7: Totals and Percentage Responses to Trusted Care Tools and Tactics

Item	Response					
	Total responses	Very Effective	Effective	Somewhat Effective	Not Effective	I Don't Use This Tool
Huddles	339	31.86%	37.76%	23.01%	5.60%	1.77%

Item	Response					
	Total responses	Very Effective	Effective	Somewhat Effective	Not Effective	I Don't Use This Tool
CPI Management Boards	337	15.13%	27.60%	28.19%	21.36%	7.72%
Theme of the Month	339	15.04%	25.07%	32.15%	19.76%	7.96%
C.A.R.E. Tools (HPI/Press Ganey Associates, Inc., South Bend, IN)	337	14.84%	29.38%	25.52%	8.01%	22.26%
Rounding	337	12.46%	21.66%	23.74%	14.54%	27.60%
Trusted Care milSuite	337	6.23%	15.73%	20.18%	14.84%	43.03%

- The daily Huddles received the highest Very Effective ratings, and those respondents' roles included Front Line (59.26%), Intermediate Leadership (18.52%), Senior Leadership (15.74%), and Others (6.48%).
- The highest percentage of Not Effective ratings were given for CPI Management Boards (21.36%), but the vast majority of respondents found CPI Management Boards Somewhat to Very Effective (71.92%, collectively).

The roles of the 72 respondents who rated CPI Management Boards as Not Effective included Front Line (86.11%), Intermediate Leadership (6.94%), Senior Leadership (2.78%), and Others (4.17%). Some front line staff rated CPI Management Boards as Not Effective because they:

- Did not understand the utility of CPI Management Boards in their roles.
- Did not receive enough training on the CPI Management Boards and found them complex.
- Were using the CPI Management Boards incorrectly.

- Had not clearly understood from leadership how the items front line staff elevated on the CPI Management Boards are addressed, so they had the impression their recommendations were ignored.
- Several responses where CPI Management Boards were reported as Not Effective correlated with leadership rounding being reported as poorly attended or not occurring at all.

Table 8 displays the percentage of responses to the eight communications and reporting security questionnaire items to assess if a culture shift was evident. Each item had an average of 339.11 (±1.05) responses. The item with the fewest responses (n = 337) was "I actively engage with my patients so that they receive the tailored care that they need."

Table 8: Percentage Response to Communications and Reporting Security Items

Survey item	**Response Percentages***				
	SA	**A**	**N**	**D**	**SD**
I actively engage with my patients so that they receive the tailored care that they need	49.55%	28.78%	18.10%	2.37%	1.19%
I am empowered by my superiors to share my opinions freely and openly to identify opportunities for improvement	42.77%	34.81%	8.85%	8.26%	5.31%
I am encouraged to look for solutions and innovative ideas to improve challenging situations	40.71%	39.82%	9.44%	6.19%	3.83%
There is respect amongst my peers in the workplace	38.35%	43.36%	8.26%	6.78%	3.24%
I feel comfortable relying on my peers to overcomes challenges and solve complex problems	27.81%	43.79%	13.61%	10.36%	4.44%
I do not feel comfortable speaking up to address concerns	7.35%	11.47%	7.06%	28.24%	45.88%

Survey item	Response Percentages*				
	SA	A	N	D	SD
My team points at people instead of understanding processes as the cause of problems or challenges in our work	6.76%	16.18%	13.82%	32.94%	30.29%
I have difficulty locating Trusted Care tools and resources necessary to reduce harm in my workplace	3.53%	11.76%	19.71%	34.12%	30.88%
**SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree*					

Figure 2 shows the breakout of Yes responses to the Yes/No questionnaire items. These questions received 340 responses, except for two items: "Is your C.A.R.E. Badge a useful resource in your daily work?" received 335 and "My leaders are engaged and encourage my team to use a CPI Management Board" received 338. The highest percentage of Yes responses (84.12%) were for "My team and I use a CPI Management Board" and the lowest percentage of Yes responses (53.43%) were for "Is your C.A.R.E. Badge a useful resource in your daily work?" The majority of respondents (80.59%) conceded that their leaders publicly recognize and award those embodying Trusted Care in their daily work. Error bars are percentage error.

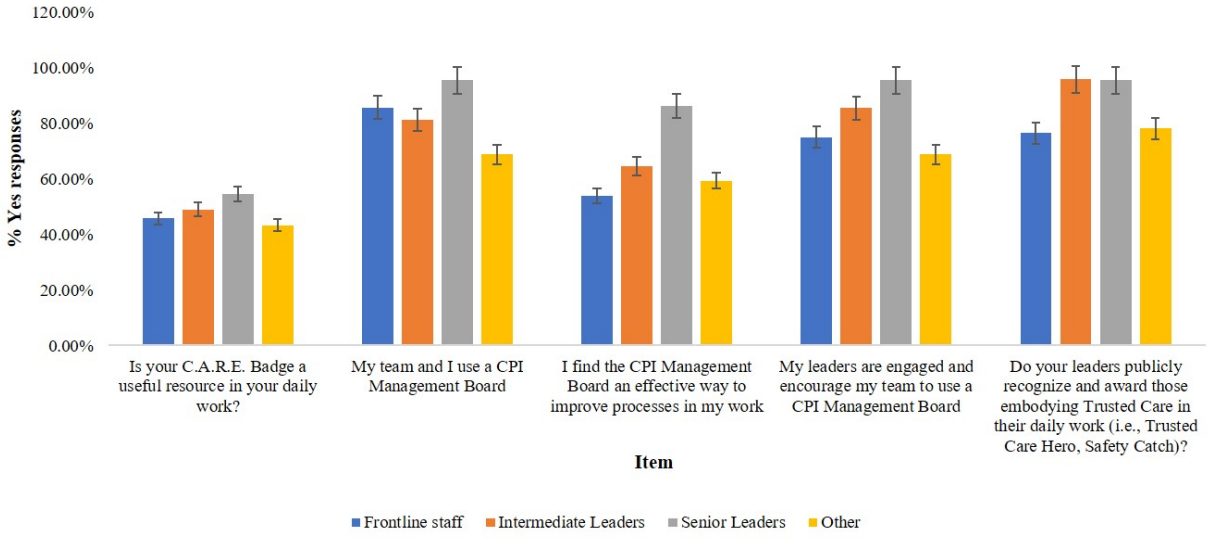

Figure 2: Percentage of Yes responses by Respondent Role

Results of the Change Management and Communications

The volume of engagement is impressive. For example, the WYW campaign:

- Motivated 250 Airmen to develop 50 videos to share their personal "why" for high reliability healthcare and create three visual posters, of which 228 copies were distributed.
- Reached more than 65,000 people via social media between June and December 2017, including 43,015 Twitter engagements (e.g., Likes, Retweets, Quotes, and Reaches), 65,397 Facebook video downloads, and 5,915 Facebook "Likes." The AFMS Public Affairs Office confirmed that the WYW campaign increased Facebook engagement by 353% from June 2017 to December 2017.
- Elicited 3,215 views of promotional materials (posters, flyers) online.

Furthermore, engagement in the HDYC campaign resulted in 1,191 views of promotional materials, 60,116 Facebook video downloads, and 2,322 Facebook "Likes."

Figure 3 summarizes 315 personnel views and opinions of the Trusted Care change management communications and training resources (solicited during the Pulse Check). Error bars are percentage errors.

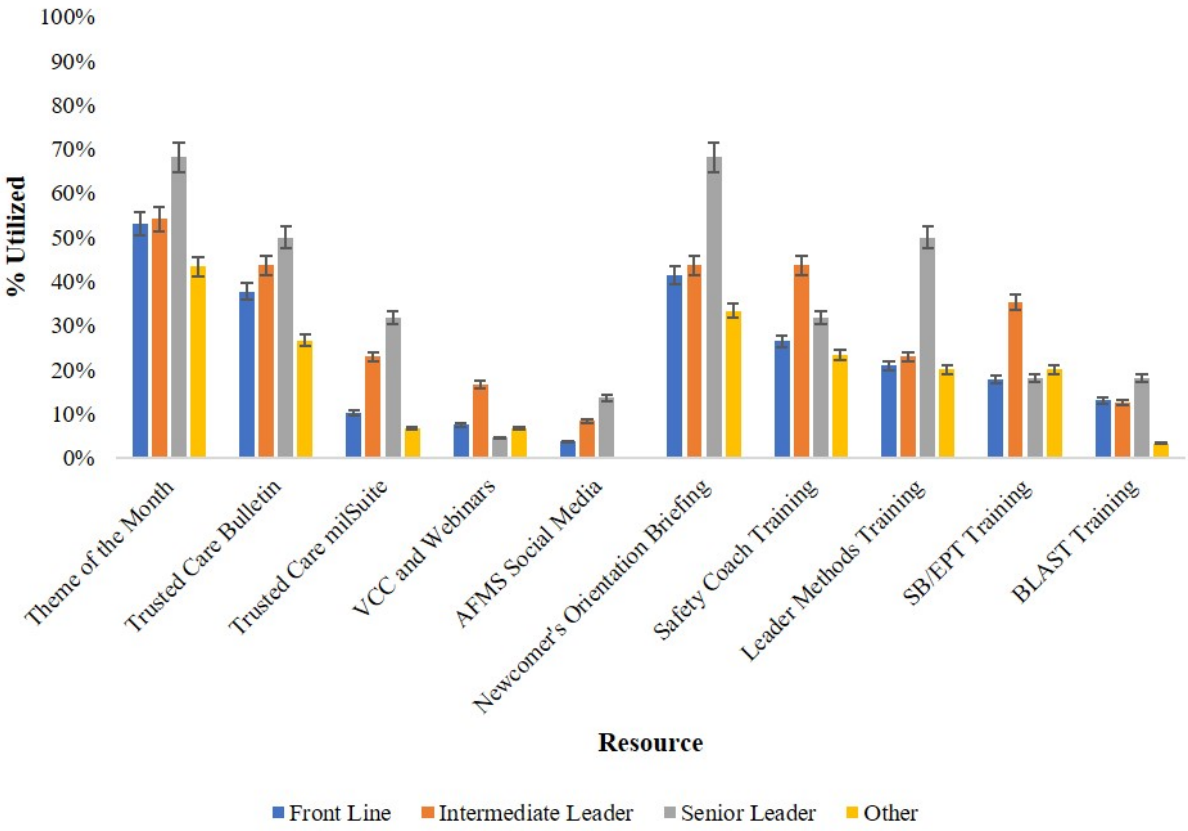

Figure 3: Responses on the Usefulness of Trusted Care Resources and Training Events

- Across roles, Theme of the Month was ranked most useful (55.40%), the median was "SB/EPT Training" (21.50%), and Trusted Care Social Media was least useful (5.00%).
- Within roles, Front Line (53.00%), Intermediate Leaders (54.20%), Senior Leaders (68.20%), and Others (43.30%) ranked Theme of the Month most useful. The Newcomer's Orientation was ranked second most useful by Front Line (41.40%), Intermediate Leaders (43.80%), Senior Leaders (68.20%), and Others (33.30%).
- AFMS Social Media received the lowest perceptions of usefulness among Front Line, Intermediate Leaders, and Others (3.70%, 8.30%, and 0.00%, respectively),

while Senior Leaders considered Virtual Coaching Calls (VCC) and Webinars the least useful (4.50%).

- The Trusted Care milSuite and BLAST training received less than 20% usefulness rating (13.90% and 12.90%, respectively).
- There was a 5.60%, 20.80% and 3.30% difference in usefulness ratings for Safety Coach Training and Leader Methods Training among Front Line, Intermediate Leaders, and Others, with Safety Coach Training receiving more favorable ratings than Leader Methods Training. However, among Senior Leaders there was an 18.20% difference in ratings favoring Leader Methods Training as compared with Safety Coach Training.

Results of the 2018 milSuite Resource Usage Data

Table 9 presents the total views for each of the milSuite resources between 2016–2018. The most views were observed for the Change Management Toolkit and the fewest views were observed for the Hero for Zero Leaderboard Competition Materials.

Table 9: Total Views for Resources on milSuite

Resource	Total Views
Change Management Toolkit	1,160 (all) 66 (current)
Donny's Story	495
Principles Poster	310
AFMS Trusted Care CONOPS	289
Trusted Care Core Values Poster	229
Theme of the Month One-Pagers	204
Hero for Zero Leaderboard Competition Materials	2/product
Hero for Zero Mobile Application Trailer	9
Safety and Reliability Virtual Coaching Summaries (HPI/Press Ganey Associates, Inc., South Bend, IN)	8

Results of the Trusted Care Website Data

Table 10 presents the average daily views for the Trusted Care website, sorted by subpage. The most average daily views were for the Home page and the fewest were for the Headquarters Air Force. It should be noted that it is unknown if all or initial visitors were routed via the Home page, which may account for the high average daily views on that page.

Table 10: Average Daily Views on the Trusted Care Website

Webpage	Average daily views
Home Page	72
Culture of Safety	22
Theme of the Month	19
Trusted Care Bulletin	8.7
Quest for Zero	2.3
Joy in Work	1.8
Headquarters Air Force	0.9

Analysis of Respondents' Communication Preferences

Figure 4 presents respondents' (n = 337) preference in Trusted Care communication channels. Error bars are percentage error.

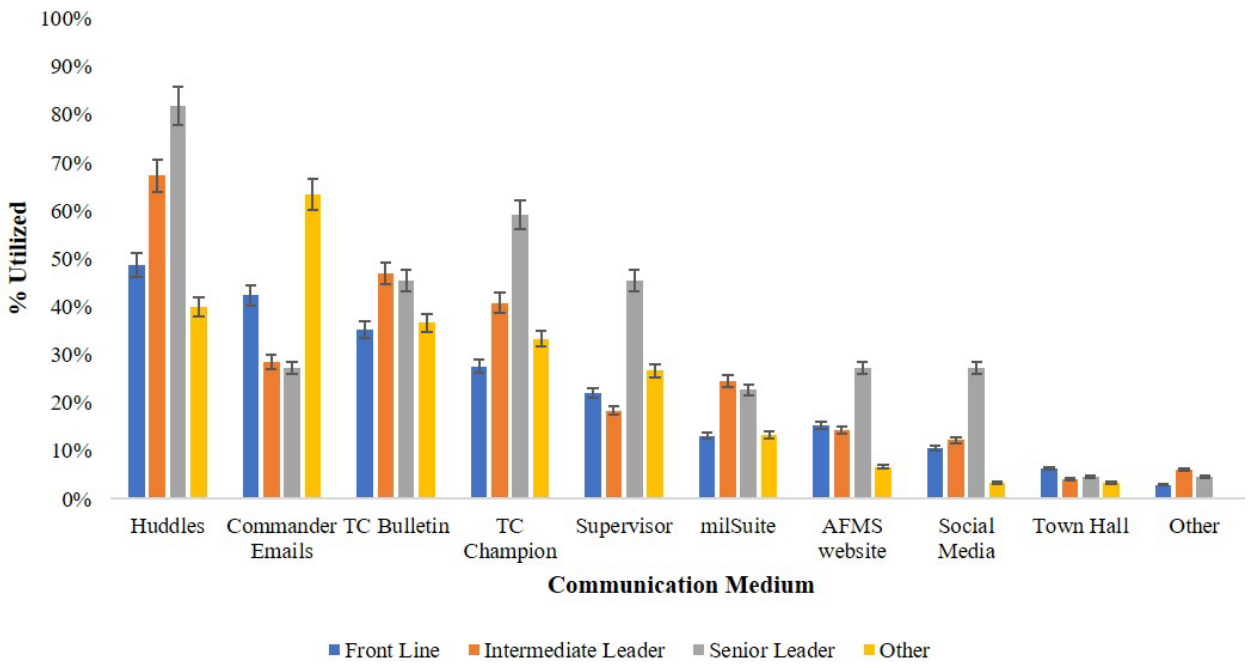

Figure 4: Respondents' Preferred Methods of Communication

- Of the respondents, 12.17% selected Huddles, 9.50% selected Commander Emails, 4.15% selected Trusted Care Bulletin, and the remaining 74.18% selected another medium from the list of options.
- Among Front Line, Huddles were most popular (13.14%) followed by Commander Emails (11.44%). Town Hall (6.36%) and Other (2.97%) were the least popular choices.
- Intermediate Leadership preferred Huddles, Trusted Care Bulletin, and Trusted Care Champion (10.20% collectively) over other methods of communication. Town Hall (4.08%) and Other (6.12%) were the least popular choices.
- Among Senior Leadership, Huddles were the most popular (13.64%). Town Hall (4.55%) and Other (4.55%) were the least popular choices.

- Among the Other respondents, Huddles and Commander Emails were equally popular (13.33%).

Discussion

The present study examined the impetus and methods of the Trusted Care framework for high reliability in the AFMS, as well as reported the outcomes from a Trusted Care implementation and sustainment campaign. To accomplish these objectives, we investigated data collected from surveys and implementation activities. Traditional methods alone had not sufficed to achieve high reliability[27] which is why the AFMS designed a multifaceted, evidence-based approach to implement and sustain HRO principle understanding and adoption, safety behavior demonstration, and error prevention and improvement science tool utilization. Accordingly, the Trusted Care approach leveraged two traditional methods of change management with the specific needs of Airmen.

Analysis of Pulse Checks indicated that respondents across different roles in the AFMS were both familiar with and actively engaged in Trusted Care. The majority correctly identified the purpose, goal, and vision of Trusted Care (Zero Harm). Respondents in all roles (Front Line, Intermediate Leadership, Senior Leadership, and Others) indicated that their leadership was very involved in Trusted Care. These findings suggest that the AFMS and its partners succeeded at implementing a change management program that included participation by all members of the organization, making AFMS consistent with the principles of HROs.[11-12]

Members of an organization in a successful HRO-driven approach must feel secure and able to communicate issues to leadership, especially issues that potentially threaten the reliability of the organization. Good communication practices in healthcare organizations not only improve workplace satisfaction,[26] but are also associated with fewer patient safety events.[27] The outcomes from the analysis of the communications and reporting security items indicated that respondents felt comfortable speaking to patients, peers, and leadership, felt a sense of teamwork in the

workplace, and were able to locate Trusted Care resources that reduce harm in the workplace. This finding is especially noteworthy, because it shows that the AFMS has substantially closed the communication gaps between staff and leadership as reported in the 2014 MHS Review.[16] For example, the report observed that, "A site visit finding showed instances in which employees expressed concerns regarding an environment where reporting was not encouraged and in fact, the response to reporting was punitive in nature" (p.190). The population of the finding was not specified, but the review covered the entire MHS. The report also cited that a majority of those visited "…felt they would be retaliated against for speaking up regarding reporting errors and events" (p.188). In the present study, 46% of respondents strongly disagreed with the statement, "I do not feel comfortable speaking up to address concerns," showing that an improvement in the proportion of staff who feel comfortable addressing concerns (i.e., reduction in the communication barriers between AFMS personnel) occurred concurrently with the implementation of the Trusted Care approach. However, there is still room for improvement.

Perceptions about communications and reporting were not uniform across respondents. For example, 20% reported neutrality about the item, "I have difficulty locating Trusted Care tools and resources necessary to reduce harm in my workplace," suggesting that additional work is needed to improve members' access to Trusted Care tools. Also, 18% of respondents felt neutral about the item "I actively engage with my patients so that they receive the tailored care that they need." Because a number of factors drive quality of patient care (e.g., how a healthcare entity is organized, how operations run, and the quality of interaction with other facilities),[29] it is not clear if the neutral responses to this item were due to the implementation of Trusted Care or other factors.

Huddles received favorable responses, with 70% of all respondents rating them as either Effective or Very Effective. This finding suggests that respondents, especially Intermediate and Senior Leaders, appreciated interacting with other organization personnel. In addition, the majority of respondents selected Huddles as their preferred source of information about Trusted Care. Experts have identified several benefits associated with Huddles in healthcare settings, including facilitating team knowledge and communication, increasing awareness about work-related events, and identifying areas for improvement.[26] Outcomes from the present study support these points and show that members of the AFMS embraced the opportunity afforded by Huddles to keep abreast of organizational events and speak with leadership about issues and concerns. It is important to note that Huddles and CPI Management Boards are not mutually exclusive but are intended to go hand-in-hand with CPI Management Boards remaining displayed for leadership rounding and other team members to engage where their skills would help others.

Although CPI Management Boards had the highest percentage of Not Effective ratings (21.36%) of all Trusted Care tools, 43% of respondents rated CPI Management Boards as Effective or Very Effective. While not as popular as Huddles, 84% of respondents reported using CPI Management Boards, 58% stated that CPI Management Boards were effective at improving processes in their work, and 77% reported that their leaders were engaged and encouraged their team to use CPI Management Boards. These figures indicate that participants favorably perceived CPI Management Boards. In fact, although only 69% of respondents in Other roles reported using CPI Management Boards, nearly all Front Line (86%), Intermediate Leader (81%), and Senior Leader (95%) respondents reported using CPI Management Boards. Visual tools such as CPI Management Boards are an important component of the Trusted Care approach

because they facilitate communication among participants and capture attention during Huddles.[26]

Online military resources, such as milSuite, had a minimal effect on the change management process and were not perceived as favorably as Huddles and CPI Management Boards. Relative to other communication mediums, milSuite was the least used tool, and only 15% of respondents considered it a preferred source. Further, in terms of training resources, only 14% of respondents rated the milSuite as useful. By comparison, 45% of respondents rated the Newcomer's Orientation Briefing as useful. Across roles, Senior Leaders (32%) were most likely to rate the milSuite as useful, rather than Front Line (10%) or Intermediate Leaders (23%). Within the milSuite resources, the Change Management Toolkit received the most views and the Hero for Zero Leaderboard and Safety and Reliability Virtual Coaching received the fewest views. Taken collectively, these findings indicate that milSuite was not as widely embraced as other resources by participants in the Trusted Care implementation.

Prior research has shown that using social media within an organization boosts organizational performance and increases information exchange.[29] Accordingly, one would expect that information exchange between personnel via social media channels would be greater during times of transition than normal conditions. However, the data on Trusted Care social media revealed a more complicated picture of how people used and interacted with social media during the Trusted Care implementation. On the one hand, staff did engage on social media (e.g., Twitter activity and Facebook downloads and "Likes"). On the other hand, both within and across roles, participants ranked Trusted Care social media as the Least Useful resource.

Although AFMS personnel selectively engaged with social media, they preferred other resources to stay informed about Trusted Care events. It should be noted that some of the social

media were not front-facing and may have required certain measures to view (e.g., a Common Access Card [CAC] reader).

Similarities and Differences versus Other HROs

The AFMS is not alone in its journey towards high reliability. High reliability is increasingly becoming a central theme of healthcare organizations both in and outside of the MHS, and other military and civilian institutions have implemented similar programs:

- The Army's Root Cause Analysis Event Support and Engagement Team (RESET) focuses on helping MTFs identify the source of problems in the delivery of care.[31-32]
- Navy Medicine's HRO Operating Model seeks to improve patient safety in specialized areas of care, such as postpartum hemorrhaging.[33]
- Utah's Intermountain Healthcare, a nonprofit enterprise, practices high reliability by using data analytics to identify which treatments work best for their most frequently seen patients ("hotspotting"). This practice has helped not only improve the quality of care but has reduced spending.[35]
- Several California-based healthcare groups also have high reliability initiatives, including Kaiser Permanente[36] and the Sharp Healthcare system.[37] California's Sharp HealthCare system[37] is a not-for-profit enterprise explicitly organized based on the five principles of high reliability originally described by Weick, Sutcliffe, and Obsterfeld.[11-12] Sharp HealthCare relies on many of the same practices as the AFMS (e.g., Huddles, encouraging communication between all personnel, and emphasizing safety).

While the AFMS approach to HRO has similarities to many other HRO-driven healthcare systems, it differs in two critical ways.

- It combines multiple key aspects of the major gold standard change management and process improvement methodologies while providing a comprehensive template for proactively creating and sustaining a culture of safety instead of targeting single aspects of safety. This systematic approach to maturing as an HRO avoids "silos of safety."[27]
- Trusted Care must maintain a focus on military readiness operations and ensure that HRO activities enhance warfighter readiness through training that will prepare for better and safer care in the far forward environment.

Limitations

This study had six significant limitations:

- The data may have included response bias to the extent that respondents felt compelled to portray leadership in the best possible light, even if their leaders were only minimally (or not even) involved. For example, it is not clear how Senior Leader leadership could be Very Involved in a program at an MTF. Presumably, their leaders (i.e., the Surgeon General) are not even on site. However, it is possible that some respondents interpreted Senior Leaders to mean, MTF Commanders and their team.
- As stated at the beginning of this paper, there are approximately 60,000 personnel working in the AFMS. The Pulse Check survey respondents represented 0.06% of the entire population. The sample size in this study represents a very small

proportion of the overall AFMS, which limits the ability to draw meaningful inferences or the generalizability of the findings to the AFMS.[38]

- Data were collected from military personnel and/or individuals who work in a military facility, so the applicability of the findings to civilian samples may be limited. Future research should examine the reliability and validity of survey questionnaires.
- Questions were raised about the potential for change fatigue[39] among staff that had endured other organizational shifts in the AFMS.[40] Campbell remarked that, "Even though the HRO concept helps mitigate many of our difficulties and improve patient safety, we run the risk of our Airmen not recognizing these potential benefits unless a significant effort is made to help curtail the stigma of HRO being just the latest in the unending string of changes." (p.5)[40]
- Doubt was cast on MTF leaders' ability to balance Trusted Care daily activities (e.g., Huddles, coaching, etc.) with their routine responsibilities.[41]
- There was concern about developing reliable tools to measure the success of the program.[41]
- Some participants were unable to access online content due to firewalls.

The strategy and implementation of Trusted Care was and continues to be a topic of concern within the AFMS, especially now that the success of the program has implications for other transformative efforts in the Air Force.

Conclusion

This study indicates that the Trusted Care approach has set the AFMS on course to high reliability. It is based on models of change management that are driven by the principles of

HROs and the data suggests that members of the AFMS share a common understanding of and support for the AFMS and Trusted Care mission and vision. Moreover, the majority of AFMS members actively embrace and use the core processes associated with greater reliability, such as Huddles and CPI Management Boards.

However, the results also indicate areas for improvement, such as strengthening perceptions of trust between front line staff and leadership, as well as modifying some communication channels (e.g., milSuite and social media) to better match the needs of stakeholders.

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