

AIR COMMAND AND STAFF COLLEGE

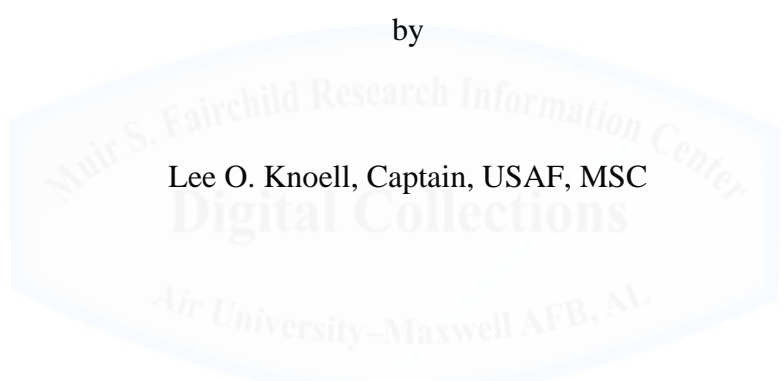
DISTANCE LEARNING

AIR UNIVERSITY

ADAPT OR PERISH: AEROMEDICAL EVACUATION IN THE
CONTESTED AIR SPACE OF THE PACIFIC THEATER

by

Lee O. Knoell, Captain, USAF, MSC



A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Proposal Advisor: Dr. Heather Marshall

Project Advisor: Dr. Andrew Niesiobedzki

Maxwell AFB, AL

August 2016

DISTRIBUTION A. Approved for public release: distribution unlimited.

Disclaimer

The views expressed in this academic research paper are those of the author(s) and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.



Table of Contents

	Page
Disclaimer.....	ii
Table of Contents	iii
List of Figures.....	iv
List of Tables	v
Acknowledgements.....	vi
Abstract	vii
INTRODUCTION	1
Overview of the Study	1
The Nature of the Problem.....	1
Purpose of the Study	2
The Research Question	3
Research Methodology.....	3
LITERATURE REVIEW	4
Sources	5
Primer on Aeromedical Evacuation (AE).....	6
Primer on the Total Force Concept	17
Primer on Anti-Access/Area-Denial (A2/AD)	22
ANALYSIS, CONCLUSIONS AND RECOMMENDATIONS	24
Analysis	24
Recommendations	34
Conclusions.....	41
Endnotes	42
Bibliography.....	46

List of Figures

Figure 1. AE Structure and Command and Control 13

Figure 2. Patient Movement Walkthrough 15

Figure 3. AE Process 16

Figure 4. AE Squadron Locations 17



List of Tables

Flight Nurse Training Courses 26

Aeromedical Evacuation Technician Training Courses..... 27



Acknowledgements

Completing this research project and degree program would not have been possible without the help, support, and love of so many people. I would also like to thank the 11 different professors that made it their goal to make me a better person. To my fellow classmates, thank you for the myriad of time spent providing me with exceptional feedback and support. Finally, to Col Diane DiFrancesco, your faith in me has made all of this possible and I am indebted to you more than you will ever know.



ABSTRACT

The purpose of this research project is to ascertain if the Total Force Aeromedical Evacuation (AE) enterprise is organized, trained, and tactically proficient to meet the emerging threats of near-peer adversaries with Anti-Access Area-Denial (A2/AD) capabilities in the Pacific Theater. This project explores the interrelations between the Air Force Total Force, the AE community, and the A2/AD environment of the Pacific in order to evaluate if the enterprise requires changes. Specifically, it reviews the ratio of Regular Air Force (REGAF) to Air Reserve Component (ARC) AE forces in order to determine the correct force mixture. Additionally, the project extensively reviews qualification and recurring training processes for problems and opportunities. Finally, it reviews current tactics, techniques, and procedures (TTPs) and force structure against the constraints of modern warfare. This project has uncovered that while the AE enterprise has performed exceptionally in the past, the new and uncertain era in which the U.S. is embarking requires new TTPs, universal standards, a refocus on qualification and recurring training processes, changes to force composition, and the basing of AE forces.

INTRODUCTION

Overview of the Study

As the United States attempts to draw down counterinsurgency operations in Southwest Asia and pivots to Southeast Asia, it will face new challenges from near-peer adversaries. Of particular concern is the maturity of the Anti-Access Area Denial capabilities of numerous nations in the region. During the past three decades of conflict, the United States has faced minimal challenges to its air superiority and has operated with significant latitude. Further, the cost of supporting these missions regarding lives lost by Aeromedical Evacuation crewmembers has been extremely limited. If AE casualties were to become more frequent as operations shift to A2/AD environments, would the Air Reserve Component support these Total Force missions with the same vigor they do now? This type of attrition on a part-time force could lead to mission failure. It also begs the question if an 86/14 split of AE forces is still appropriate. Further, the sheer size of the area of responsibility dwarfs others in comparison and presents many medical, airlift and operational challenges. Additionally, it takes almost two years to train qualified AE crewmembers, a problem that has existed since at least the early 1990s. These concerns warrant analyzing the configuration of the AE system and the training methods used in preparation for operating in a highly contested airspace throughout the Pacific theater. After all, the promise of expert in-flight medical support that AE provides to the warfighter, along with the safety of AE crews and their patients requires safeguarding at all costs.

Nature of the Problem

The United States Air Force must adapt operations in preparation for a shift to the Pacific theater because multiple countries in the region are near-peers to the United States militarily and possess significant Anti-Access and Area-Denial capabilities. Tenuous relationships with China

and North Korea and the emergence of non-state actors operating globally increase the probability of conflict. Therefore, AE crews and their patients are subject to a greater degree of danger when compared to recent conflicts in Southwest Asia. Examples from World War II and Vietnam demonstrated that conflicts with adversaries that possessed A2/AD yielded more airborne casualties and aircraft losses.^{1 2} To better prepare for operations in contested airspace and an uncertain post-cold war environment, the Air Force must place more emphasis on critical aircrew and medical training. Also, the redistribution of AE squadrons containing crews and operations support teams to strategic locations in the region will need to occur to support the United States forces at risk in the region. Finally, an organizational composition change must occur where additional numbers are added to the enterprise and the ratio of the Regular Air Force (REGAF) to Air Reserve Component (ARC) assets are revisited. Presently, it is about an 86/14 percent split in favor of the ARC. There are 27 squadrons in the ARC and 4 in the Regular Air Force. The era of US air superiority has created a false sense of security and eroded basic war fighting skillsets. Also, the Air Force is almost completely reliant on the ARC AE in other than peacetime operations. Some may feel that AE is already operating on a very high level and wonder why the United States Air Force should fix what is not broken. It is acknowledged that the 98 percent AE patient survivability rate throughout recent conflicts demonstrated the systems capabilities and saved thousands.³ Nevertheless, to continue to operate at this high level, the enterprise must adapt its training, force mixture, and footprint to face the new challenges of a new and more advanced battle space that has developed in the Pacific region.

Purpose of the Study

The purpose of the study is to review the current U.S. aeromedical evacuation system and determine if the current configuration will meet the challenges that near-peer enemies present in

the A2/AD rich environment of the Pacific. These challenges include meeting the Combatant Commander's required capabilities for medical support and ensuring the proper manning level is in place to meet mission requirements. Furthermore, continuous evaluation of critical medical and aircrew training is necessary to ensure expert in-flight medical care of patients and the safety and competency of the medical aircrew members.

Research Question

With its unique, dangerous, and critical mission, AE crews and operation support personnel are often subject to different challenges and risks than traditional medical forces. To mitigate risk and ensure the greatest chance for success, in this highly volatile and ever changing modern warfare landscape, begs the question: How should the United States Air Force organize the Aeromedical Evacuation enterprise for operations in the Pacific theater?

Research Methodology

This research paper will use the problem/solution framework to illustrate how the USAF should organize the AE enterprise to conduct potential operations in the Pacific theater. Through a comprehensive study of AE operations, past and present A2/AD capabilities and the use of the total force enterprise, the reader will see the connection between the three different topics. Significant research exists on each of these subjects. However, a correlation between the three does not exist. Using a pragmatic research philosophy, the project will have freedom to explore both qualitative and quantitative research methods to look objectively at all of the data and factors that demonstrate the ideal ways to posture AE forces to meet these challenges.

LITERATURE REVIEW

Congressional reports, Joint Chiefs of Staff guidance, and military directives all demonstrate the importance of the Total Force, successful operations in A2/AD environments, and the criticality of the Aeromedical Evacuation system. However, limited research has been conducted into considering how the three will need to interoperate in tomorrow's battlefield.

This research will fill in the gaps that exist by using current and new research to tie the areas together and make arguments for improvement. For example, Maj Dalene Perdue argued that without significant changes to AE aircrew tactics training, and the potential loss of Geneva Convention protected status, that by 2010, a majority of AE crewmembers would lack the proper training to carry out their duties and be at greater risk for being shot down and ill-prepared to survive.⁴ Aircraft designated with a red cross are protected, while, those repurposed for AE missions are not. This research project will argue that these training gaps are even more evident today than when she wrote her report in 2000.

Switching topics to the total force, Lt Col Linda Wise claimed that that the Reserve Component should focus on expansion, surge capability and REGAF Continental United States backfill, rather than steady-state contingency operations.⁵ Conversely, Lt Col Oates asserted that that the ARC was relied upon and expertly carried out operational missions, supported ongoing conflicts, and increased AC experience levels.⁶ Using these arguments as a starting point, the role of the total force in AE operations will be explored to determine the appropriate force mix.

Moving forward to the ever-challenging topic of A2/AD, Maj Lowe acknowledged the risks that near-peer countries pose to the United States. Specifically, he stated that enemies with the foreknowledge that they cannot fight head-to-head with American forces would develop countermeasures to make it impossible to establish a footprint, superiority, or dominance in

multiple domains. Further, other enemies will see this tactic succeed and emulate it.⁷ As such, the Air Force, which has been Counterinsurgency focused for over a decade, must adapt to meet the challenges presented in an A2/AD environment with a near peer adversary and AE is no exception. This research will explore whether the current structure of the AE enterprise is configured to meet these challenges.

Sources

The key sources for this research project come from all three of the areas discussed above. In the area of A2/AD, Congressional research reports on the pivot to Asia and the Joint Concept for Access and Maneuver in the Global Commons (formerly AirSea Battle Doctrine) are considered primary sources and will be reviewed for doctrine, tactics, techniques and procedures that can be modified to suit the AE community. Additionally, primary sources for statistical information pertaining to the employment of ARC forces, value, cost, and mission set will be reviewed using historical reports from previous conflicts, RAND reports, and annual snapshots from the United States Air Force Reserve and Air National Guard. Additionally, AE doctrine from operational instructions, Air Mobility Command (AMC), and Air Force Reserve Command (AFRC) will serve as primary sources and will be reviewed to establish areas where there are gaps in training, problems with organizational layout, and tactical shortcomings for operating in the A2/AD age. AE enterprise struggles and best practices gleaned from the July 2016 AE Senior Leaders Council will provide additional data for evaluation. Finally, personal accounts from individuals who participated in conflicts as far back as the Vietnam War and as recent as the War on Terror will be interwoven into the research project for a first-hand perspective of AE operations. Secondary sources include Air Force Institute of Technology, Air War College and Air Command and Staff College research papers that will provide additional perspective from

officers educated on all three topics. Specifically, perspectives on how the United States should prepare for the A2/AD environment now and thirty years from now were reviewed for inclusion and adaptation into this research. Further, papers were reviewed that discussed how the AE enterprise should operate in a post-cold war environment. Additionally, research papers that discussed the unique contributions the ARC has made in the modern military age were reviewed to aid in determining potential for future contributions. In addition, reports were reviewed for strategic and tactical lessons learned from previous conflicts by the AF Medical Service. However, before attempting to tie AE, A2/AD and Total Force concepts into a cohesive argument, a primer on the three topics is in order.

Aeromedical Evacuation History

Aeromedical Evacuation has existed nearly as long as manned flight and has proven to be an effective means to transport casualties rapidly to more definitive treatment.⁸ In a sense, it developed along with the airframes that it provided care onboard.⁹ As such, AE pioneers worked tirelessly, made many sacrifices, and underwent numerous trials and tribulations to develop the pre-cursor to, and advance the ability to sustain life through enhanced medical treatment procedures.¹⁰ The robust and world-renowned system that is in place today that has impacted millions of lives worldwide, in both peacetime and war owes a great deal to these people, and their stories deserve space in this narrative.

A 1977 report from the Air Force Surgeon General's office, *A Concise History of the USAF Aeromedical Evacuation System*, is referenced by many AE related research papers and provides a great deal of insight into the history of airborne evacuation methods. This report recalls that the first recorded airborne evacuation (via balloon) occurred when over a hundred wounded French soldiers evacuated to safety by during the Franco-Prussian war of 1870-1871.¹¹

World War I Era Aeromedical Evacuation

After the turn of the century and before World War I, two U.S. Army Officers, Capt George H.R. Gosman and Lieutenant A. L. Rhodes built and tested the world's first air ambulance with mixed results and support from military leadership.^{12 13} However, their efforts brought the concept of the AE to light to military leadership.¹⁴ Additionally, France and the United States were able to convert the Curtiss JN-4 "Jenny" Biplane for use as primitive AE aircraft. The Jenny enabled the AE of wounded personnel throughout the European theater and also delivered flight surgeons to aircraft crash locations so they could provide medical support.¹⁵ It is obvious nearly one hundred years later that airlift of patients is quicker and more effective than weeks-long voyages by sea. However, it took until nearly the end of World War I for leaders to begin to see its value.

The inter-war years saw further advancement in AE, via the development of purpose-built aircraft for the AE mission and the retrograde of cargo aircraft for AE use on return missions.¹⁶ Most notably, a Registered Nurse by the name of Ms. Laretta M. Schimmoler championed the flight nurse and AE cause while meeting stiff resistance from all manner of civilian and military agencies. Her insight helped shape the Flight Nurse Corps we have today, and she is an early AE pioneer.^{17 18}

World War II Era Aeromedical Evacuation

The World War II era is where AE truly came into its own and recognized for the critical support it provides to the warfighter. Though, the beginning of the conflict saw the U.S. military caught in a dogma loop, whereas transport by sea was the status quo and AE touted as unsafe and not feasible. Fortunately, or unfortunately, depending on one's perspective, the sheer numbers of casualties and need to airlift patients more quickly, illustrated the need for the critical capability

AE brings to the fight.^{19 20} During this period, the structure of the Army Air Corps AE component began to take shape. Squadrons were created, specialized training conducted and aircraft earmarked for tactical and strategic airlift were used to bring down the risk of death on AE missions from 6 per 100,000 to 1.5 per 100,000.²¹ In total, AE airlifted nearly 1.5 million during World War II and this conflict solidified AE's role in the modern military.²²

After World War II had ended, the National Security Act of 1947 created the United States Air Force. When the USAF separated from the USA, some personnel also transferred to this new service. Of those that transferred, there were about one thousand Army nurses; some of which had already conducted AE missions during World War II.²³ During this inter-war period, the mission of AE expanded to encompass peacetime patient movement missions and saw the mission delegated to the Military Air Transport Service.²⁴ Of note, the peacetime AE mission still exists to this day; however, there are significantly fewer missions due to the advent of TRICARE in the 1990s. This managed care system enabled military personnel and their dependents to utilize local non-military Medical Treatment Facilities (MTF) and negated the need for transport to military MTF specialty centers.

Korean and Vietnam War Era Aeromedical Evacuation

The Korean War presented numerous challenges for the AE system to overcome. Chief among them was the lack of infrastructure in the Pacific.²⁵ Accordingly, USAF leadership created a new system.²⁶ Not surprisingly, General William Turner, a pioneer of air mobility operations, saw to the expansion of AE operations to better support the population at risk.²⁷ As with World War II, the retrograde of cargo aircraft for AE use was the policy of the day. During this period, AE changed from emergency evacuation to include more routine missions.²⁸ It was also a period of infighting between the Army and the Air Force as to who is responsible from

what aspect of patient evacuation. The outcome was that the Army would handle rotary wing and the Air Force fixed wing evacuations.²⁹ Again, AE proved its usefulness and ability to adapt to new and unfamiliar circumstances through the establishment of a tactical AE system and the airlift of some 311,673 patients to more definitive treatment both throughout the theater and across the Pacific Ocean.³⁰

The same theme repeated in the Vietnam War with urgent need for AE forces to conduct airlift of ill and injured patients from faraway lands, and again these Air Force medics rose to the challenge. As part of a cohesive system with Army MEDIVAC, AE was able to rapidly evacuate patients to higher echelons of care and lifesaving treatment far sooner than previous conflicts. This resulted in the saving of many lives.³¹ This was also when you began to see the modern aircraft used for these purposes. For example, the C-131A Samaritan, C-9A Nightingale, C-130 Hercules, and C-141 Starlifter conducted tactical and strategic AE during this time.³² The Vietnam War saw an additional 406,022 patients airlifted for definitive treatment.³³

1980s and 1990s Era of Aeromedical Evacuation

Following Vietnam, the AE system conducted routine patient transport to specialists around the continental U.S. and was used for numerous other wartime, and non-traditional missions. One such mission was the 1973 aeromedical evacuation of U.S. Prisoners of War held since the Vietnam War. Operation HOMECOMING, returned 591 service members to the U.S. after years of brutal captivity at the hands of the North Vietnamese.³⁴ Other missions AE supported were the airlift of Vietnamese orphans to the U.S. during Operation BABYLIFT in 1975 and the AE of survivors of the Jonestown massacre in November of 1978.

In the 1980s, Air Force medics conducted tactical and strategic AE for numerous operations and overcame some additional obstacles. For example, during Operation URGENT

FURY in 1983, Total Force AE crews from the 1 AES, Pope AFB, North Carolina and the 31 AES, and Charleston AFB, South Carolina, provided expert in-flight medical treatment of patients while facing and overcoming the unfamiliarity of working in a joint service and tactical environment.³⁵ Additionally, in 1989, during Operation JUST CAUSE, Total Force AE teams airlifted 257 patients from Howard AB, Panama to MTFs in Texas for more definitive treatment. The efforts of the Joint Casualty Collection Point medics on the ground, and AE crews in the air ensured a 99.3 percent survival rate.³⁶

The 1990s started with Iraq invading Kuwait and the eventual extraction of the interlopers from their sovereign neighbor by a multinational force of the willing. In preparation for significant resistance from the elite Republican Guard and seasoned Iraqi forces, the Department of Defense (DoD) was extremely cautious in its planning. Accordingly, many DoD agencies, to include the USAF AE enterprise, expended a great deal of resources to ensure victory over a tough and motivated enemy. With initial casualty estimates ranging in the tens of thousands and patient movement figures at six thousand per day, the AE enterprise had no choice but to mobilize the ARC and deploy nearly two thousand AE personnel between the U.S., Germany and Middle East.³⁷ Interestingly, 97 percent of the AE forces were from the ARC.³⁸ In the end, there were over twelve thousand patients evacuated with zero deaths. Additionally, opportunities for improvements to training, force structure and readiness were uncovered.³⁹ As the decade progressed, AE supported additional operations, such as RESTORE HOPE in Somalia, JOINT ENDEAVOR in Eastern Europe, SOUTHERN WATCH, and NORTHERN WATCH in the Middle East. This era also saw the retirement of the C-9 Nightingale, C-141 Starlifter, and the fielding of the C-17 Globemaster and retrofit of the KC-135 Stratotanker for AE use. Finally, the 1990s saw major overhauls to the AE system. These changes aimed at

supporting an expeditionary focused population at risk. They also prepared the enterprise for short notice, limited scale conflicts that the uncertainty of the post-cold era had made a reality. Chief among the changes was the transition from transporting “stable” patients to “stabilized” patients. This shift enabled the airlift of higher acuity patients to locations with more definitive treatment, earlier than previous thought possible. As such, the level of Flight Nurses (FN) and Aeromedical Evacuation Technicians (AET) training increased to prepare them to care for intensive care type patients. Additionally, a new type of team, the Critical Care Air Transport Teams (CCATT), handled the most difficult of cases. Lastly and in keeping with its operational flying roots, the AE enterprise moved from underneath the Surgeon General side of the USAF to the Operations side and crews became universally qualified on airframes.

Aeromedical Evacuation in the New Millennium

The turn of this century has been an incredibly busy time for the AE enterprise. The terrorist attacks of September 11, 2001 sent the nation to war with Al Qaeda and its affiliates. The Global War on Terror/Overseas Contingency Operations continues to this day. According to the Defense Casualty Analysis system, as of 20 July 2016, the resulting Overseas Contingency Operations have resulted in 52,442 U.S. service members wounded in action, many of which required AE.⁴⁰ Additionally, tens of thousands more were airlifted for various disease and non-battle related injuries. According to the latest U.S. Transportation Command (USTRANSCOM) Patient Movement Fact Sheet available, between 10 October 2001 through 5 November 2008, 54,712 patients were airlifted from the Central Command (CENTCOM) Area of Responsibility (AOR) to the European Command (EUCOM).⁴¹ After airlift to Landstuhl Regional Medical Center, in Germany, patients often return to the continental U.S. for treatment or return to the home station. As you can see, thousands more patients fly this route on both AE missions on

military aircraft and via civilian airframes. This increases the numbers of patients aeromedically evacuated significantly. Since 9/11, Total Force AE crews and operations support teams have been deployed to operational locations around the globe in support of Operations NOBLE EAGLE, ENDURING FREEDOM, IRAQI FREEDOM, NEW DAWN, FREEDOM'S SENTINEL and now INHERENT RESOLVE. With the historical section complete, the discussion will now turn to the current configuration of the AE enterprise.

Current State of Aeromedical Evacuation

By Joint Publication 4-02, *Health Service Support*, Air Mobility Command (AMC).

Manages and operates the intertheater and AE subsystems, Civil Reserve Air Fleet, and provides AE elements and planning assistance to the theater, in intermediate supporting theaters, or in the U.S.”⁴² Further, AE forces are modular in design in keeping with the expeditionary and building block approach to modern warfare.⁴³

Additionally, Air Force Policy Directive (AFPD) *Aeromedical Evacuation Mission* states:

The rapid evacuation of patients during contingencies is necessary to prevent undue suffering and preserve military strength. Aeromedical Evacuation provides time-sensitive en route care of regulated casualties to and between medical treatment facilities using organic and/or contracted aircraft with medical aircrew trained explicitly for the mission. Aeromedical Evacuation forces can operate as far forward as aircraft are able to conduct air operations, across the full range of military operations, and in all operating environments. Specialty medical teams may be assigned to work with the AE aircrew to support patients requiring more intensive en route care.

The Air Force has primarily been organized, trained and equipped as an air and space expeditionary force (AEF). The Air Force will ensure AE unit mission readiness by conducting operational and training missions. These missions require AE clinical personnel to maintain currency and proficiency. Although not resourced for humanitarian assistance, disaster response or defense support to civil authorities (DSCA), the Air Force will be prepared to provide AE for these operations as directed by the National Command Authority.⁴⁴

Finally, according to Air Force Instruction 11-2AE vol. 3, *Aeromedical Evacuation*

Operations Procedures.

AE provides time-sensitive en route care of regulated casualties to and between medical treatment facilities, using organic and contracted aircraft with medical aircrew trained explicitly for this mission. AE forces can operate as far forward as aircraft can conduct air operations, across the full range of military operations, and in all operating environments.⁴⁵

A Total Force AE team of clinical and operations support experts prepare to execute missions globally, during contingency, natural disasters, and humanitarian operations. Figure 1 provides an example of the current AE structure.

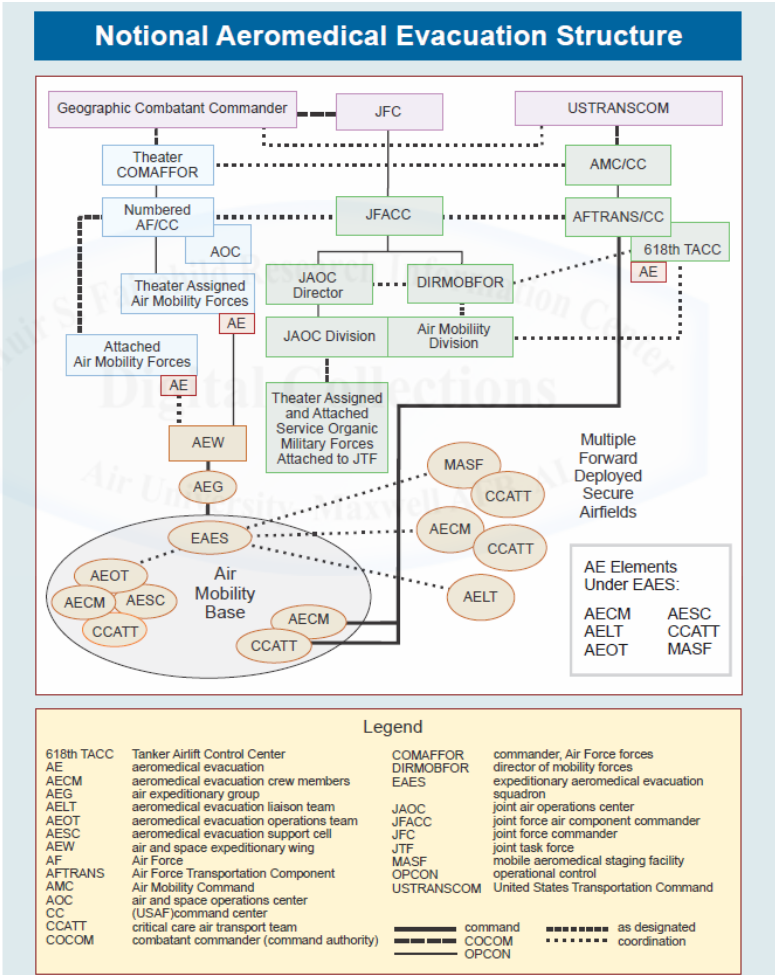


Figure 1. AE Structure and Command and Control⁴⁶

Intra-theater AE missions occur at the tactical level and those at strategic level, inter-theater airlift. For example, flying from Baghdad International Airport, Iraq to Balad Airbase,

Iraq would be an example of intra-theater AE. Conversely, flying from Balad Airbase to Ramstein Airbase, Germany would be an example of inter-theater AE. There are three different airframes that AE crewmembers (AECMs) are universally qualified on, they are the C-130 Hercules, C-17 Globemaster III, and KC-135 Stratotanker. If the situation dictates, AE uses other opportune aircraft, such as the C-21 Learjet, KC-10 Extender, and C-5 Galaxy.

A typical AE crew consists of five U.S. Air Force medical personnel. Two members are Officer Flight Nurses and three members are Enlisted Aeromedical Evacuation Technicians. The Medical Crew Director is a flight nurse and in charge of the crew. Crew augmentation options exist to support unique mission requirements, higher patient loads, or unforeseen circumstances.⁴⁷ Critical Care Air Transport Teams augment AE crews when needed. These limited and highly skilled teams permit the airlift of the most complex and severe patients that are either stable or stabilizing through the creation of an in-flight Intensive Care Unit. CCATT teams consist of a doctor, critical care nurse, and respiratory technician.⁴⁸ Operations support teams comprised of Medical Service Corps Officers (MSCs), Health Service Managers, Medical Logisticians, Aviation Resource Managers, FNs and AETs are responsible for providing crew, resource and mission management, and planning in support of AE operations.

In a deployed location, the Medical Treatment Facility treat U.S. forces that sustain wounds in combat, contract a disease, or suffer a non-battle injury. Some examples include Air Force Theater Medical Hospitals or Expeditionary Medical Squadrons, U.S. Army Combat Support Hospitals or U.S. Navy Expeditionary Medical Facility. If the injury or illness is minor, they are treated and returned to duty. If the injury or illness is more severe, they are admitted to the facility to undergo additional treatment. If the clinical staff determines the patient requires capabilities not available at the MTF or evacuation is needed to save the patient's life, limb or

eyesight, a patient movement request (PMR) is generated via the Transportation Command (TRANSCOM) Regulating and Command & Control Evacuation System (TRAC2ES). The PMR is reviewed by clinical and administrative staff at a Patient Movement Regulatory Center and if appropriate, validated for AE. There are three AE patient movement presidencies, Urgent (move immediately to save a life, limb, eyesight, or prevent further difficulties due to a serious illness), Priority (patients must receive care quickly, move within 24 hours) or Routine (move within 72 hours on preplanned missions).⁴⁹ Once the patient is manifested on to a mission, they transfer to an Expeditionary Patient Staging Squadron (ERPSS) where they are observed by clinical staff prepared for flight and await their airlift. When their aircraft arrives, ERPSS personnel transport the patients to the aircraft where the AE crewmembers are prepared to accept them and provide expert and potentially lifesaving in-flight medical care as they transit the AE system in route to more definitive treatment at more sophisticated MTFs. Please see Figure 2 and 3 examples of the AE process.

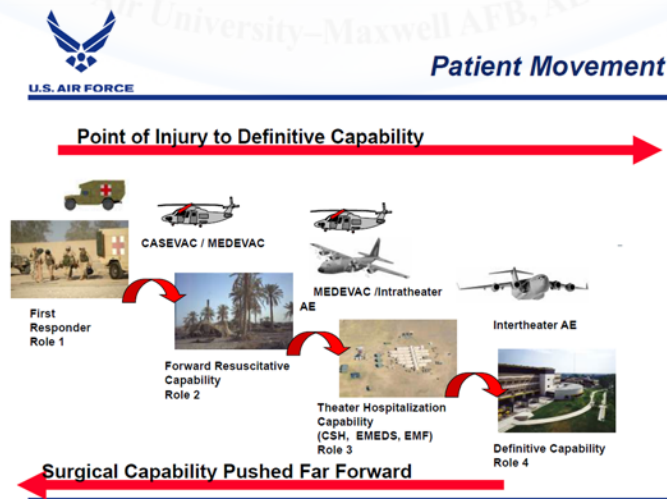


Figure 2. Patient Movement Walkthrough⁵⁰

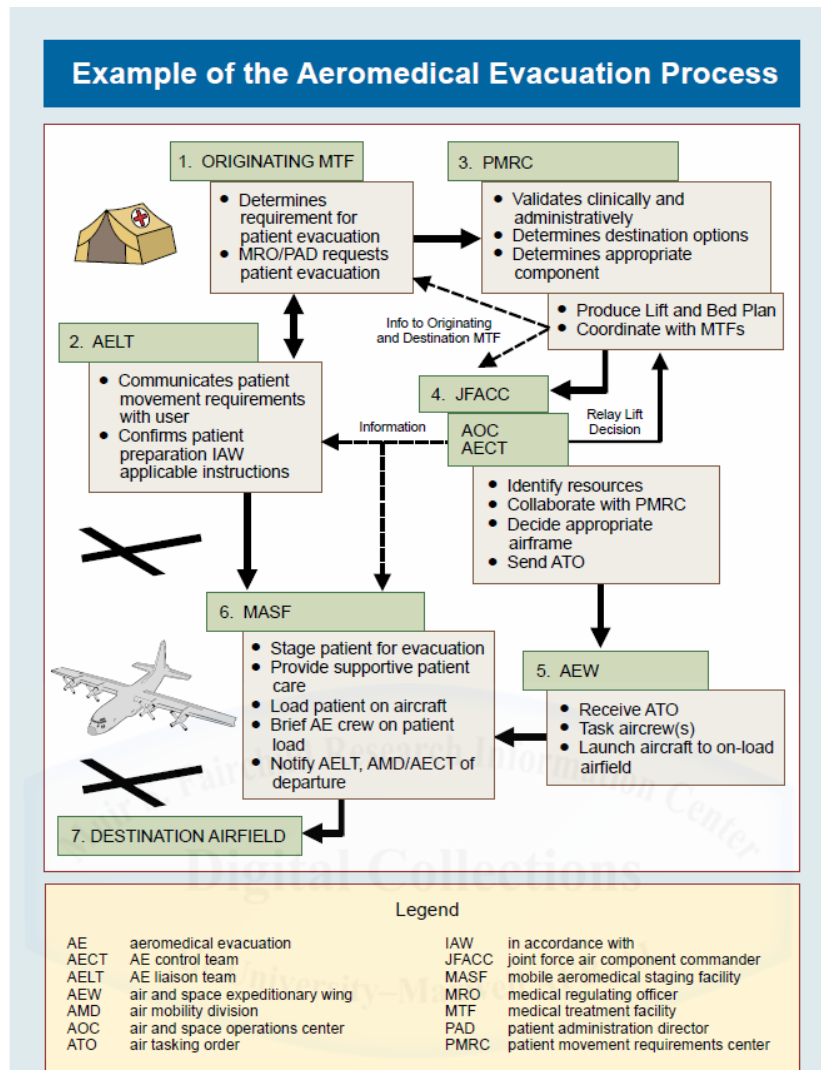


Figure 3. AE Process ⁵¹

To obtain crewmember qualification, FNs and AETs must attend Air Force accession schools, Commissioned Officer Training (COT) for officers and Basic Military Training (BMT) for Enlisted. Because perspective flight nurses are already qualified registered nurses (most with Critical Care experience) there is no nursing technical school. However, their enlisted counterparts attend the Basic Medical Technician Corpsman Program, Aerospace Medical Service Apprentice Phase II course. Once an Airman completes these basic courses, their supplemental AE crewmember training begins. This includes Water Survival, Survival Evasion

Resistance Escape training, Flight School, Aircrew Initial Qualification Training, and Ground Training. Experience has illustrated that the time from selection for accession or enlistment to Fully Mission Qualified status can be up to two years.

As mentioned in the introduction, the composition of the AE Enterprise is about an 86/14 percent split in favor of the Air Reserve Component. Specifically, there are 9 Air National Guard (ANG), 18 AFRC, and 4 Regular Air Force (REGAF) permanent AE squadrons in the enterprise. This equates to an 86 to 14 percent ARC/REGAF split. Of the 29 squadrons, two are located Outside the Continental United States (OCONUS). One squadron is located at Kadena AB, Japan and another at Ramstein AB Germany.⁵² The rest of the squadrons are interspersed throughout the Continental United States (CONUS). Please see Figure 4 for a complete listing of AE Squadrons and locations. At the time of this writing, the 36 AES located at Pope Army Airfield is in the process of moving to Keesler AFB, MS.⁵³



Figure 4. AE Squadron Locations⁵⁴

Primer on the Total Force Concept

Throughout history, a nation’s army usually consisted of its citizens. Yet, in some cases, people of conquered nations were conscripted to fight and support the war efforts of the

victorious nation. Further, people of one nation have volunteered to fight other nation's battles for numerous reasons. For example, Alexander the Great was known for bringing the people of conquered nations into service during his famous conquests in the Middle East and Asia in the early 300s B.C.⁵⁵ In the early 1800s during the Napoleonic Wars, the British Army's numbers were so decimated that they brought in Spanish troops to fill their numbers.⁵⁶ A more recent example would be the Gurkhas that served the British during the time of Indian colonial rule and to this very day, while not maintaining British Citizenship.⁵⁷ These examples aside, and in most cases, due to the realist nature of most states and the anarchistic way of the world, the defense of the homeland fall to its trusted inhabitants. Traditionally, a nation's forces are divided amongst the regular standing full-time Army and reserve forces that participate part time and in times of crises. After all, who has a more of a stake in keeping their state free from the influence of other nations, than its citizens? As such, discussion of foreign forces forced or voluntarily fighting for other nations is out of scope for this research project. This section aims are to explain the historical implications of the concept of the citizen soldier, explain the U.S. use of these military forces throughout its history and clarify some misnomers about this topic. A firm understanding of this history will help one understand where the U.S. met the mark, failed in its endeavors and some cases exceeded society's expectations of its military forces. This data will be useful in helping to determine the best theoretical force mixture (REGAF, ARC) moving forward in this uncertain modern era of warfare with state and non-state adversaries.

Throughout its history, citizen soldiers had a hand in fighting for and protecting the U.S. and its interests. In actuality, even before it was a nation, there were groups of people who fought and died for this nation's independence. In the highly informative RAND report on the topic titled, *Demystifying the Citizen Soldier*, Raphael Cohen explains that the concept of the

citizen soldier went through four unique stages. He named them the Militia era (1175-1830), the Volunteers (1831-1902), the Strategic Reserve (1903-1990) and finally the present era, the Operational Reserve (1991-Present).⁵⁸ Additionally, he discussed the three major tenants ascribed to the National Guard and uncovered some common misnomers found throughout its history. Each era boasted some successes and yielded some failures. Yet, there is no question that the citizen soldier has a place in the narrative alongside his or her regular military counterparts. Moreover, you will see that each era learned from the previous one and formed the Reserve Component (RC) in place today. An interesting fact, is that the present U.S. National Guard traces its lineage all the way back the first militia formed in Massachusetts all the way back in 1636.^{59 60} For brevity's sake, the two most recent stages, the Strategic Reserve and the Operational Reserve are the focus of this narrative.

The focus of the Strategic Reserve was to backfill regular "army" forces when tasked to go to war. As such, reserve forces rarely participated in contingency operations. In *Demystifying the Citizen Soldier*, Cohen illustrates that as 20th Century wars occurred, the use of reserve forces drastically reduced from conflict to conflict to nearly no participation in contingency operations by the time the Vietnam War happened.⁶¹ After World War II and through the 1960s there was talk at the highest level consolidating or getting rid of both the Reserves and National Guard. Fortunately, the system of checks and balances worked and the Legislative branch of the government and lobbyist groups kept this from happening.⁶² Consider if you will, that rather than mobilize the Reserves, President Johnson instituted a draft. Furthermore, when he did call up the National Guard after the Tet Offensive in 1968, the majority of the units did not even meet "minimum combat readiness standards."⁶³ The Guard became a known place for the affluent to "hole up" while the war raged on in the Pacific and

eliminated the risk of being drafted and sent overseas.⁶⁴ However, the National Guard provided much-needed peacekeeping forces during the turbulent 1960s. Two other scholarly sources encapsulate the perception of the reserves of this time and refer to them as “Cold War flying clubs” with “once in a generation” activations or deployments.^{65 66} Often, due to the minimal budget, training, equipment, ARC readiness was nowhere close to the level of the Active Component. Some even went as far as to call them “Weekend Warriors,” and question whether the Reserves could recruit quality talent, and if upgrading their capabilities was even worth it. Finally, the National Guard was incredibly late to integrate minorities and woman into the force. Integration of the armed forces occurred in the 1940s. Though the National Guard did not integrate races until the mid-1960s and it was not until the 1970s they granted woman equal rights.⁶⁷ At this point in history, the reserves had a serious identity crisis. Despite the naysayers and its problems, the concept of the Total Force gained momentum based on the potential value it brought to the table and the Total Force paradigm went from concept to application in the early 1970s. However, it would be decades later before the force truly proved its true value. Secretary of Defense Melvin Laird first advocated for the Total Force Policy in 1970 and was implemented by Secretary of Defense James Schlesinger in 1973.⁶⁸ This policy integrated the Active Component, National Guard, and Reserves into one fighting force. Accordingly, this was also when the draft ended and the services became 100 percent voluntary.⁶⁹

The Total Force of Today

The Total Force Policy of 1973 integrated all components of the military services, improved funding streams, enhanced equipment procurement processes, and increased training levels. Arguably, the 1980s is where the ARC cut their teeth. Accordingly, logistical, readiness and training issues came up and were refined. Some services were more effective at doing so

than others. However, just 20 years later the fall of the Berlin Wall and end of the USSR signaled the end of the Cold War and, in effect, removed the U.S.'s greatest threat, and with it ushering in an unprecedented era of peace. As such, U.S. leadership saw this as an opportunity to cut military forces that, theoretically, would no longer be needed and reduced both reserve and active component forces significantly.⁷⁰ These changes ushered in the operational era of the reserves and signaled the end of the strategic era. Leadership acknowledged the critical role the ARC played in modern warfare and made it a full partner in all future conflicts. Nevertheless, the reserves began this era with a reduced budget, which, in hindsight, was counterproductive. For example, nearly 500,000 Army Reserve and Guard personnel have participated in overseas contingency operations since 9/11. Additionally, from 1953-1990 the ARC was involved in only 11 conflicts. However, in the operational reserve age starting in 1991, with DESERT STORM, the ARC has participated in over 60 actions through 2001.⁷¹ Operations DESERT SHIELD and DESERT STORM in 1990 and 1991 proved naysayers wrong and demonstrated the reserves could handle being part of a major conflict when called up.⁷² The number of activations has only increased in the past 15 years the U.S. has been at war and the ARC has assumed greater percentages of AMC related missions such as, aerial refueling, airlift and AE.⁷³ With its three numbered Air Forces (4, 10, 22) the AFRC alone supports all five of the USAF Core Missions.⁷⁴ Further, the U.S. Army and USAF National Guard support the core and domestic/peacekeeping missions.⁷⁵ In 1997, Secretary of Defense William Cohen pushed the Total Force Integration initiative even further into the national defense lexicon through the codification of important principles required for senior leaders to implement.⁷⁶ The next major change to Air Force and Total Force doctrine occurred in 1998 with the implementation of the Air Expeditionary Force (AEF) structure. The AEF construct divided total force assets into lightweight deployable teams

able to respond to any manner of contingency, humanitarian, or peacekeeping mission more effectively within 72 hours. The foresight of Air Force leadership would pay great dividends just a few years later as the turn of the new century brought with it the terrible events of 9/11. In the new realities of the global war on terror, the Guard and Reserve have been called upon more than ever to participate in contingency operations.⁷⁷ The reservist brings a great deal of military and civilian experience to the fight. Often, reservists are highly skilled in their fields when compared to their military counterparts. For example, some AETs are Critical Care Nurses in the civilian sector. Alternatively, they possess entirely different skillsets from different career fields and bring these skills to the fight. For example, some of the MSC officers have an Information Technology background versus Hospital Administration. Drawbacks are less training time, a more relaxed mentality, and requirement overloads. Hundreds of thousands of total force Airmen have deployed globally and conducted full spectrum military operations once reserved for only active component forces. The question is, does the reserve have a tipping point? How much use is just too much? Some argue that the line between the active component and reserves forces has blurred too much. The past 15 years have challenged the citizen Airmen, families, communities, and employers in ways never seen before. For example, many reservists assigned to the AES enterprise have deployed two, three, or even four times since 9/11. A benefit to using ARC forces is that it places veterans in the local community who espouse the merits of the organization and the cause. One that historically, has been a microcosm of society, however, has significantly distanced itself from the civilian populace in recent years. With the total force discussed, the topic will now move to the A2/AD environment.

Primer on A2/AD

Anti-Access and Area Denial, or A2/AD, are commonly used military terms in military. Nevertheless, how much does the layperson truly know about the strategies? When most people think about A2/AD, they think of surface to air missiles shooting down aircraft. The ensuing paragraphs explain the whole breadth of these tactics and how enemies of the U.S. use them. According to the oft-quoted 2003 report from the Center for Strategic and Budgetary Assessments, *Meeting the Anti-Access and Area-Denial Challenge*, Anti-Access Strategies “aim to prevent U.S. forces entry in a theater of operations.” Additionally, “Area-Denial operations aim to prevent their freedom of action in the more narrow confines of the area under an enemy’s direct control.”⁷⁸ After review, it is not surprising that these tactics are not as new as their moniker suggests. Denying an enemy the freedom to conduct the military operations when and where they would like to is as old as war itself. For example, strategically placed fortresses, landmines, booby-traps, moats, knights, infantry, archers, walls, trebuchets, and natural barriers are examples of A2/AD operations. Modern and emerging examples include the attempted annexing of the South China Sea and integrated Surface to Air missile systems. Global Positioning System spoofing or access denial. Also, cyber attacks, long-term electromagnetic pulses, anti-ship cruise missiles deny and deter. Furthermore, near peers and non-state actors possess, weapons of mass destruction, advanced fighters and strong intelligence, surveillance and reconnaissance (ISR) platforms. Recognizing the threat that A2/AD tactics present, the 2010 and 2014 Quadrennial Defense Review (QDR) reports discuss them at length. The 2010 QDR focuses on ensuring U.S. power projection through the deterrence, defeat, and successful defense against A2/AD tactics from nations China, Iran, and North Korea.⁷⁹ It recommends the DoD establish a “joint air-sea battle concept” to serve as a countermeasure against A2/AD operations.

Specifically, it aims to “enhance future long-range strike capabilities, exploit advantages in subservice operations, increase resiliency of U.S. forward posture and base infrastructure, ensure access to space and the use of space assets, enhance the robustness of key C4ISR capabilities, defeat sensor and engagement systems, enhance the presence and responsiveness of U.S. Forces abroad.”⁸⁰ Short of creating hardened forward operating locations in areas that are contested or being denied by the enemy, the footprint of U.S. forces will need to be moved further back from the forward edge of battle (FEBA). Doing so would increase the distance and time it takes to support troops on the FEBA and will require a review of combat support tactics techniques and procedures. The 2014 QDR echoes the sentiment of the 2010 QDR and cautions “Future conflicts could range from hybrid contingencies against proxy groups using asymmetric approaches, to a high-end conflict against a state power armed with WMD or technologically advanced anti-access and area-denial (A2/AD) capabilities.”⁸¹ For example, China and North Korea are attempting to offset the strength of the U.S. through continuous development of A2/AD capabilities.⁸² Some of these include North Korea’s attempts to develop nuclear weapons, and enhance missile systems in an effort to influence and coerce other nations in the region.⁸³ The strongest power in the region, China, has used the proceeds of their thriving economy to modernize their military, enhance their influence, deny access to the South China Sea, coerce their neighbors, and protect their nation against perceived threats. This has led them to create man-made landmasses which double as airbases and a means to deny access through created “sovereignty.” With all three areas discussed at length, the paper will now move to the final section, Analysis, Recommendations and Conclusions.

ANALYSIS, RECOMMENDATIONS AND CONCLUSIONS

ANALYSIS

Current Challenges facing the AFRC AE Enterprise

From 25-28 July 2016, the Aeromedical Evacuation Branch of the Headquarters Air Force Reserve Command Directorate of Air, Space, and Information Operations hosted this years AE Senior Leadership Development Council (AESLC) at Joint Base Lewis McChord, Washington. Leadership from AFRC, Headquarters Air Force, Air Mobility Command, Operations Groups, and AE Squadrons met to discuss the current state of the enterprise, new initiatives, best practices and areas of concern. AFRC AE leadership, aware of the ongoing problems befalling the squadrons, was prepared to discuss these issues and provided insights and countermeasures to team.

The top concerns are listed below:

- Nearly all AFRC AE units are facing severe readiness and manning problems.
- Pressure to meet Combatant Commander requests for tactical AE forces.
- AE enterprise unprepared for future A2/AD environment.
- AFSC awarding schools and operations training process disjointed and lengthy (additional six months to a year).
- Financial uncertainty inhibiting annual spend plan adherence and ability to conduct training.
- Attrition of mid to senior level leadership/loss of AE corporate knowledge.
- Air Reserve Technician hiring process ineffective.
- Air Base Wing support issues (FSS, AMDS and Finance).
- Limited opportunities for operational support Unit Type Code (UTC) training.
- Availability of flying training slots an issue.
- Recurring operational mission training trumped by various forms of ancillary requirements.
- STARS training canceled and training requirements levied on squadrons.
- Equipment problems.
- Information technology assets, program and support lacking/cumbersome.
- Mentoring/PME/Recognition problems.

Manning and Education

With the exception of three squadrons, all remaining units (15) are facing FNs, AETs, and MSC shortages in varying combinations. The inability to keep AE crews, liaison and operations teams UTCs fully staffed prevents each squadron from being ready to carry out numerous elements of its wartime mission. This decreased readiness has far-reaching consequences for the reserve AE enterprise and ultimately the wounded warrior. Of the reasons cited, three were common amongst all squadrons.

First, the time in which it takes FNs and MSCs to go from accepted by the unit to receiving their direct commission, is at least a year. Bringing AETs on board does not take nearly as long, however, like the FNs; they must attend a myriad of clinical and flying training courses before they are “basically qualified” and are counted as “good numbers.” Conversely, the AETs (in most cases) must attend enlisted tech school.

Second, these schools do not run concurrently, are at different locations around the country, and obtaining slots is challenging. Commonly, it takes two years for a FN or AET to become fully qualified (from date of acceptance). The chart below illustrates the total days of each training course.

Flight Nurse Initial Qualification Diagram			
Course	Length⁸⁴	Total Calendar Days w/ 2 travel days per course	Location
RCOT	13	15	Maxwell AFB, AL
COT	23	31	Maxwell AFB, AL
SERE	19	21	Fairchild AFB
Water Survival	2	4	Fairchild AFB
FNs Initial Qualification	22	31	Wright-Patterson AFB, OH
FN (AKA FTU)	20	28	Wright-Patterson AFB, OH
Training Days RCOT Option	76	99	
Training Days COT Option	86	115	

AET Initial Qualification Diagram			
Course	Length⁸⁵	Total Calendar Days w/ 2 travel days per course	Location
BMT	56	58	Maxwell AFB, AL
Basic Medical Technician Corpsman	70	100	Maxwell AFB, AL
Aerospace Med Svs Apprentice Phase II	30	44	Various
SERE	19	21	Fairchild AFB
Water Survival	2	4	Fairchild AFB
AET Initial Qualification	22	31	Wright-Patterson AFB, OH
AET (AKA FTU)	20	28	Wright-Patterson AFB, OH
Training Days	219	286	

Commissioned Officer Training and Health Service Administration (HSA) School are the only courses MSCs must attend to become qualified. However, oftentimes, it takes an additional year from accession to qualification due to HSA school slot availability.

The third reason is attrition or injury of mid to senior level leadership. Each mid-level or senior leader that departs takes with him or her years of operational AE corporate knowledge earned primarily while our nation was at war. Consider if you will, that if you were in the military when 9/11 happened you now have almost 15 years in the military. Additionally, every first term Airmen that leaves, took two years to get qualified and most likely had at least one deployment. With the current process in place, in order to break even on personnel, you would need to start training up replacements two years prior to the departure of said Airmen. Further complicating the situation for FNs and AETs, is the fact that per AFI-11-402, *Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges*, double billeting non-rated flying personnel is prohibited with very few exceptions. They include a 180-day double billet waiver from AFRC/A3MA or by obtaining approval to exceed 180 days from the AF/A30-AT (aka the Pentagon).⁸⁶ This means that you can only put an AE flyer on aeronautical orders in an overage

position for 180 days. After 180 days, they must be moved out of the flying position and taken off flight status if there are no open slots. Operation support (non-flying) personnel do not have this stipulation. However, they must re-complete an overage letter every two years. Taking into consideration the fact it takes two years to gain and train three critical types of AE personnel, it becomes easy to see that if even a small percentage of a squadron's critical personnel were lost while flying missions, the enterprise would not be able to bring on new personnel as fast as they need to fill the slots. The majority of squadrons cannot even do it with zero combat losses. The prospect of warfare against near-peer adversaries or non-state actors in A2/AD environments like the Pacific theater carries with it the distinct possibility that casualties will occur.

Formal Schools and Annual Training

In discussing Survival, Evasion, Resistance, and Escape (SERE) training with various members of the 315 AES, it was uncovered that there have been four different SERE-style training courses in the last 10 years. In the mid-1990s, there was the one week Medical Survival Course attached to flight school. People who went through this course refer to it as "club med" for the simple nature of the program. Apparently, the message got out, because the AE enterprise converted to SV80A SERE School. According to the course description, this course is 19 days of intense aircrew training that will

Train aircrew and other designated personnel in employment of principles, procedures, techniques, and equipment that enhance survival, evasion, resistance, and escape prospects, regardless of climatic conditions or hostile environments. Its objective is to facilitate their return with honor to friendly forces without rendering aid or comfort to the enemy, with or without organized recovery.⁸⁷

Later, for financial reasons, the AE community nixed the 19-day SERE course in favor of a 4-day Evasion and Conduct After Capture (ECAC) course located at Lackland AFB, Texas.

According to this course description ECAC was designed to

Train designated personnel in tactics, techniques, and procedures (TTP), and equipment that enhance evasion, resistance, and escape prospects, in any hostile environment. Its objective is to facilitate their return with honor to friendly forces without rendering aid or comfort to an enemy, with or without organized recovery. Evasion and Conduct after Capture (ECAC) is a weekly, 4-day (M-TH) course that provides personnel recovery, urban evasion, and full-spectrum resistance training with an emphasis on hostage captivity. ECAC is only recommended once in an Airman's career and it is designed to bridge a resistance-training gap for Airman and Soldiers deploying to uncertain environments.⁸⁸

Apparently, this training did not fully meet the needs of the AE community, because effective this year, AECMs are now attending the full 19 SERE courses again. In summary, if an AECM joined the AE community in the last 20 years, they may have three very different SERE skillsets. This lack of uniformity and knowledge puts AECMs at risk in the event they are shot down, must try to survive and return with honor.

Switching topics to recurring training, on paper it seems as if all the bases are covered. However, upon further investigation, the quality of training varies widely. For example, SS-05, Water Survival, can take place via CBT, a pool, the ocean or a lake. Again, uniformity is missing. SS02, Combat Survival, and SS03, Conduct After Capture training techniques vary widely as well. Another example occurred this past Reserve weekend, in which LL04, Aircrew Chemical Defense Training and LL06, Life Support Equipment Training courses finished in just 20 minutes. While not as high visibility as many other courses that occupy Reservists time, they are critical to survival when conducting the wartime mission.

Along the same lines, a critical piece of recurring AFRC medical training, the Sustainment Training to Advance Readiness Skills (STARS) course closed down in 2015. The STARS course provided “a one stop, dynamic Total Force Sustainment training program maximizing global medical readiness.”⁸⁹ Medical personnel who attended earned Readiness

Skills Verification (RSV) credit, in some cases Continuing Education Units, Emergency Medical Technician (EMT) refresher training, Self-Aid and Buddy Care (SABC), access to high-tech simulation labs and more. Due to budgetary constraints this program was folded and now each squadron is on their own to complete all of the above training. Again, there was a functional program in place that was centralized, uniform, and cost effective. The STARS program website states the program “include[s] exposure to leading-edge, evidence based care concepts and opportunities to enhance skills using state of the art simulation equipment; all resulting in increased confidence to execute both peacetime and wartime medical operations.”⁹⁰ In the programs place are 18 AE unit programs each running all of the components of STARS (RSVs, CEUs, EMT, SABC). As you can imagine, this training is neither uniform nor as cost effective as the schoolhouse. The other types of medical units also used this program, so that number grows even larger.

Interestingly, ARC Non-Line Officers can attend two different Officer Training Schools. They are Commissioned Officer Training and Reserve Commissioned Officer Training (RCOT). The first course is 23 training days over 4 weeks and the second is 13 straight training days. RCOT exists to provide licensed professionals a means to complete training as quickly as possible with limited interference to their civilian lives. COT is the school that the REGAF sends their directly commissioned non-line officers and there are slots available for those in the ARC. Because, there are two different officer training school courses for ARC Officers, personnel come out of the schools with two very different experiences. Again, this lack in uniformity creates challenges at the basic officer competency level. Further, if a FN or MSC cannot break away from their civilian occupation for 4 weeks versus 2 weeks to attend COT, how are they going to be able to break away to the myriad of other training and certifying

schools required by their AFSC?

Finally, the topic of operations support or ground training merits discussion. Unlike the flying operations side, there is no formal school to train operational support personnel in their respective UTCs (AE Operations Team and AE Liaison Teams). Therefore, there is no universal standard by which to train them. Instead, there are as many different ways to perform these functions, as there are squadrons. Squadron “isms” have taken over and every squadron has their own way of doing business in absence of guidance. Just recently, AMC vetted AFRC/A3MA’s draft AEOT Training Guide and approved it for use. The squadrons have actually been using for about a year in an attempt to get the training they need. In conjunction with annual exercises such as PATRIOT WARRIOR and Joint Readiness Training Center (JRTC), these measures are improving overall AE operations knowledge. However, ground training is still lagging behind flying training.

AE Force Structure

Can the AE enterprise stay 86/14 in the new era of modern warfare? Is the AE community over reliant on the ARC? Interestingly enough, the majority of AE deployment lines on the AFRC side have been filled with volunteers. Some of them have even deployed on many occasions. For example, from September 2001 – February of 2014, members of the 315 AES stationed at Joint Base Charleston, South Carolina, deployed on 267 occasions. This equates to 44,186 mandays or 121 years.⁹¹ Across the ARC and Air Force Medical Service (AFMS) there are similar stories such as this, the 315 AES is by no means unique. This is a testament commitment of the ARC. However, on occasion, partial mobilizations are used when the numbers are just not there. People are retiring, burning out, and experiencing injuries that preclude them from deploying. Additionally, ARC has filled REGAF lines when they are short

crews or support personnel and vice versa. Consider if you will, how the ARC enterprise would be affected if losses started to mount up in an A2/AD environment like the Pacific. As illustrated earlier, the long training tail would immediately put the enterprise in a manning deficit. However, there are other second and third order effects to consider. First, not a single participating AECM has lost a fellow crewmember on a mission. You would have to go back to Operation BABYLIFT in the Vietnam era to find the last casualties, and this was due to mechanical problems. Losing a fellow medic is just not something that the masses of the AFMS are accustomed and there will be a toll to pay. This, as demonstrated in other conflicts, can cause psychological trauma resulting in the inability to continue in their current capacity. There has already been an increased incidence of PTSD cases at the squadron level due to seeing other aspects of war. This will also lead to attrition of forces, as a percentage of those in the AE community would not serve if the stakes were higher as they have different motives for participating. Unlike the REGAF, it is relatively easy to depart from the AFRC. Simply, fail to show up for nine periods (2.25 UTAs) and you will face administrative discharge. Alternatively, put in for a request to go Inactive Ready Reserve and with Commander Approval, and you are on your way. Simply put, when people enlist or commission in the ARC, they are aware that they can pretty much leave when they want and some unethical people take full advantage. Another impact would be challenges in recruiting new personnel. Oftentimes it is the “phony tough or crazy brave” that want to join an occupation that could spell death.⁹² Unfortunately, it takes putting someone in the position to see which of the two they are. With training and manning issues discussed, the focus will now change to challenges with how AE conducts business.

Tactics, Techniques and Procedures (TTPs)

Another problem identified by senior AE leadership was meeting the pressure from the

user services to meet their AE needs. Through multiple briefings and one-on-one conversations with recently deployed AE Commanders, a few trends have become evident.

First, the AE community must adapt to meet the patient evacuation needs of the user services. The strict adherence to lengthy and rigid validation and regulation processes does not provide the flexibility and timeliness that other services require in patient movement. AE must be able to operate as far forward as conventional aircraft can land. Time from alert to take off is a regular issue that commanders are trying to shorten as much as possible. One commander's goal was just 30 minutes. A common statement heard by AE leadership in deployed locations like Afghanistan, is that it takes us too long to get up in the air.⁹³ Accordingly, the AE enterprise must adopt a tactical mindset. Not all patient movement scenarios fit into predetermined categories or are as cut and dry as many would like. Sometimes, casualties are in places too far for MEDIVAC to pick up casualties in a time sensitive manner and a fixed wing aircraft would make more sense. Furthermore, it is not always feasible go through the long validation process just for the sake of regulating the patient. On occasion, transporting unregulated or minimally vetted patients must be an option to save life, limb, or eyesight. Additionally, fixed wing aircraft are flying the same routes right above the head of MEDIVAC helicopters.

Secondly, AE leadership acknowledges the strategic necessity of the military's shift to the Pacific; and they believe that A2/AD is the war of the future and the enterprise needs to prepare.⁹⁴ They highlighted the fact that with little to no warning, advancing near-peers or non-state actors could use long-range weapon systems with increased lethality and deny significant portions of the battlefield. These actions will destabilize the region and challenge the U.S.'s air and sea dominance. This means a smaller forward footprint and increased distances spanned to support them. If you review figure 2 on page 15, you will see that AE starts in the II or III

echelon of care. These facilities generally receive patients from intra-theater airlift via C-130, MEDIVAC or ground ambulance. What if the Role II or III had to move hundreds of miles away due to A2/AD threats? How would this affect medical care and method of transport?

First, it would significantly increase the time that a patient gets to his or her first level of definitive treatment. Unfortunately, the 98 percent survivability rate so many are accustomed to may go down. Second, it would mean that quick in service select scoop and go missions would have to be sent in to get these fresh casualties as soon as possible. Ground time would be minimal and there would be limited time for patient hand off. Additionally, there would be a significant threat to the AE crews and crews flying the aircraft. Third, the unstable nature of the recently wounded may require surgery on the back of the plane or active resuscitation while en route for unstable critical patients. Interestingly enough, this is a capability the Air Force already has in its Special Operations Surgical Teams. According to the 24 Special Operations Wing website, these teams

consist of active-duty Air Force medical professionals including trauma and orthopedic surgeons, emergency physicians, nurse anesthetists, surgical scrub techs, critical-care nurses, and respiratory techs. They are charged with providing far-forward medical care during combat operations wherever the U.S. military is engaged. When not on active deployment, the team trains in surgery, in trauma centers and in intensive-care units.⁹⁵

Additionally, according to Air Force doctrine there are numerous En Route Critical Care teams “that provide advanced clinical care by augmenting an evacuation platform medical crew during any portion of patient movement.”⁹⁶

Basing

In the time since the start of this project, DoD leadership announced that the USAF contingent of Pope Army Airfield in North Carolina is being relocated. The 36 AES (AFRC) is

moving to Keesler AFB, MS and the 43 AES (REGAF) to Travis AFB, CA. The movement of bases further west illustrates the Air Force's commitment to support the Pacific AOR. However, is moving two squadrons sufficient to support the largest geographical command of the U.S.? For those who have made the trip from California to Hawaii, they know that it is a long way away. Perhaps it is time to look at moving AE squadrons further west. The 18 AES operates out of Kadena AB, Japan and has a detachment that operates out of Hickam AFB, HI. This is the extent of AE assets in the Pacific, short of those on the West Coast. With TTP challenges discussed, the focus will now change to project recommendations.

RECOMMENDATIONS

Accessions, Education and Training

The criticality of streamlining the accessions process cannot be overstated. The process is fraught with delays resulting in the process taking a year or longer. Depending on the circumstances, the blame shifts from the member, to the Regional Medical Unit, to the Surgeon General's Office, all the way up to the Secretary of the Air Force level. Recommend that major stakeholders at each level come together and conduct an Air Force Smart Operations for the 21st Century, Rapid Improvement Event.

Once a member gains to a squadron, the next priority is getting them fully qualified. Again, this process can take up to an additional year, particularly for FNs and AETs. For the purposes of this paper and squadron operations, gained date is the date that a member reports to the squadron. For Enlisted, it is after BMT and Phase I and II of Technical Training School. For Officers it prior to attending any schools, due to their direct commissioning. As illustrated by the charts on pages 26 and 27, even if an Officer attends COT there is only 115 total training days with weekends and travel included. If you were to throw in the obligatory family days, you

could possibly get the number to 120 or so days. For the enlisted, they show up to the squadron a qualified Airmen and medic by the time they start participating, therefore, total training for them is only 84 days with weekends and travel included. Again, adding the family days into the equation and you arrive at 89 or so days. As you can observe from the data above on pages 26 and 27, there are large gaps in training that equate to wasted time. A concerted effort to reduce these breaks in training results in qualification between 245-276 days earlier. Rather than have ARC AECMs take a curriculum that is disjointed, synchronize so that they occur back to back. Alternatively, consolidate all of the training into one course at a single location. An unqualified AECM enters at one end and a fully qualified FN or AET leaves the other. The REGAF has managed to reduce training time to 77 days from 103-193.⁹⁷ Perhaps, the ARC needs to benchmark off their processes. One thing is certain, taking over a year to train up AECMs is bad for the ARC AE enterprise as it leaves critical positions unfilled and renders squadron's non-mission ready.

While on the topic of formal schools, the creation of formal ground training school is an imperative for operational support personnel assigned to non-flying UTCs. As mentioned above, there is no school, just a training guide for one UTC, the AEOT. The lack of a training standard has led to a disparity of knowledge amongst squadrons and reduced effectiveness of operation support personnel. Several ad hock solutions exist; however, they reflect the different culture of each squadron and contain different "isms" that may not transcend their location. For example, one squadron's MSCs launch and recover all AE missions, another only launches, and yet another is not involved at all. As you see, three units, three different practices, and three different standards of UTC training. How this has been acceptable for so long, defies

conventional logic. Ultimately, whether operation support personnel or AECMs, all AE members in the Total Force must train to the same standards.

One exceptional way to train operational support personnel and flyers are exercises. PATRIOT WARRIOR, JRTC, SOUTHERN STRIKE all provide excellent training simulated AE operations in a deployed environment. Unfortunately, there are finite amounts of opportunities to attend each year due to available slots, competing interests and sometimes funding. Recommend that squadron's quotas increased. At one time, an AE Contingency Operations Training course was required and provided all AE personnel with a basic understanding of the patient movement system. Around 2013, the AE Patient Staging Course took its place, however due to poor training outcomes the AE contingent no longer attends. The AE community requires a suitable AE contingency operations training course to meet the challenges of the modern battlefield.

Speaking of field training, as mentioned above, the last 10 years has seen SERE training change four different times. This means AECMs have three different SERE skillsets depending upon which course they attended. AECMs train to a universal standard and are universally qualified to conduct AE operations on the three primary aircraft for AE and aircraft of opportunity. As such, crews require universal training on critical lifesaving skills in the event they are shot down, evading or captured. Accordingly, recommend that SV-80A remain the standard for AECMs and that it is not changed back to ECAC or any other abbreviated version. In addition, many interviews with AE flyers have uncovered that recurring aircrew training they are getting is not meeting the mark. Recommend placing a renewed emphasis on this recurring training as it may save their lives someday. Transitioning to the other skillset of AECM's we will now discuss recommended improvements to clinical training.

While they now share the same initial technical training school, the training that Airmen, Sailors, and Soldiers medics receive is significantly different. Recommend that the DoD level the competencies across the enterprise as to promote one universal training standard and interoperability. Finally, recommend bringing the STARS program back on line. This centralized location provided all ARC medical squadrons a myriad of training opportunities and a significant cost savings. Finally, incorporating all components of the Total Force and joint partners into training is key to ensuring interoperability when needed during contingency, humanitarian, or peacekeeping medical operations. While on the topic of the Total Force, the next section will discuss recommendations for the Total Force AE structure.

AE Force Structure

Now that the ARC is an operational force, vice a strategic one, it has participated in numerous missions as a Total Force partner. As illustrated in the Total Force primer, ARC forces have been a part of every major conflict since DESERT STORM and performed exceptionally well. With that said, there are concerns that the Reserves are becoming too much like the REGAF and have moved too far away from its strategic roots. Since 9/11, the ARC has ramped up operations to an unprecedented level. Since 2001, Total Force AECMs have been deployed every day of every year and it is taking a toll on the enterprise. Recommend that like in the mid-1990s, an Air Force Tiger team form to evaluate if the current force structure is suitable for this new era of modern warfare. A few topics for consideration are, blending squadrons into Total Force entities. This would leverage the best of both components into a vibrant and seasoned organization. Perhaps they could discuss increasing the ratio of REGAF to ARC forces in order to ensure requisite forces remain on hand. Additionally, since there will be more casualties in a war with a near-peer enemy, perhaps increasing staffing would be a good

idea. Furthermore, leveling squadron personnel from units that traditionally have had a hard time supporting UTCs, to those with stronger readiness records, will resolve some of the manning problems, and improve the readiness of the force. Finally, building additional squadrons in strategic locations around the Pacific to meet potential demands from the area of responsibility and population at risk is worth considering. With recommendations for the AE Force Structure made, the topic will now turn to recommended changes to TTPs.

Tactics, Techniques and Procedures

At the 2016 AE Senior Leadership Council, a representative from the En Route Medical Care Division at AMC briefed on the current and future state of AE. A key take away from her presentation was that future conflicts might look like any manner of recent conflicts or reflect the culmination of knowledge an adversary acquired, resulting in a completely different type of war.⁹⁸ Interestingly, in discussing new types of war, A2/AD and how to provide Health Service Support in this environment was the focus of the “future” portion of this presentation. Providing en route care in this environment will look significantly different from conflicts where the U.S. had, and perhaps, took for granted the level of air and sea dominance it had. The following recommendations highlight the steps required for the USAF AE enterprise to meet the challenges of a highly contested Pacific Theater. First, communication between components of the DoD en route patient care system must improve. The steady state operations of OIF and OEF over the 15 years have significantly degraded the ability to stand up UTCs from a “bare bones” state and run operations. This was extremely evident in recent PATRIOT WARRIOR exercises where, communication and information technology issues were the norm. Therefore, recommended that prior to next major exercises, elements of the U.S. Army, Navy, and Air Force medical exercise planning teams develop a comprehensive way for all three branches to communicate. Along the

same topic, the entire en route care system, from Casualty Evacuation to Rotary Wing Medical Evacuation to Fixed Wing Aeromedical Evacuation, requires further integration and interoperability to ensure optimal patient outcomes and safety of crews. Access to denied airspace may be only available for a finite amount of time and patients cannot wait for the system to catch up with their needs. As such “we must evacuate when “can” instead of when patient (or system) “ready.”⁹⁹ This means exploring a way to reduce validation time or waiving it when the situation dictates and moving unregulated patients when the opportunity arises. Of course, this means that the myriad of different Air Force en route care teams must consolidate and integrate more effectively. For example, consider moving CCATT teams over to the AE enterprise, thereby granting them all the rights of a true flying member, versus an operations support flyer. Alternatively, cross training AECMs to work with unstable versus stabilized patients and augmenting crews with a doctor. Many ARC medical personnel actually perform duties far and above those, they perform in the service. Perhaps, it is time this USAF leverage these assets. Speaking of doctors, recommend embedding surgeons into the en route patient care system. This enables a C-17 to serve as an ad hock operating room when needed. As illustrated in the TTP Analysis, the USAF already has teams in the inventory that could serve this role and has explored mixed discipline teams on missions in Afghanistan. While the lines between MEDIVAC and AE divide amongst service lines, it may be time to revisit. For example, the tiltrotor V-22 Osprey with its helicopter and turboprop features opens up many capabilities once unavailable. Finally, an A2/AD environment presents significant threats to AECMs and those conducting staging operations. The AE and SG enterprise must get back to the basics, renew focus on basic Ability to Survive, and Operate knowledge. Again, years of fixed base operations have eroded core warfighting skillsets. Unfortunately, when or if the U.S. engages with a near

peer-adversary or non-state actor it is going to be asymmetric in nature and occur at a moment's notice. Our AE forces must be ready to answer the call.

CONCLUSIONS

The AE enterprise has enjoyed increasing levels of success in every campaign it has participated and currently has a 98 percent survivability rate for patients. These gains are a direct result of the enumerable sacrifices made by each generation's military medical professionals. The new era warfare is rife with uncertainty, near-peer adversaries, and non-state actors armed with malicious intent and highly sophisticated asymmetric tactics, such as A2/AD. In order for the U.S. to maintain air, space, and sea dominance, TTPs must adjust to the changing times. Air Mobility operations, specifically, AE are no exception. This research has uncovered that if the U.S. plans on providing the same level of en route care to its ill and injured service members in this new and challenging environment, significant changes will need to be made in the manner the enterprise is presented and trained.

END NOTES

-
1. World War II Foundation, "WWII Aircraft Facts", 2014, <http://www.wwiifoundation.org/students/wwii-aircraft-facts/> (accessed 13 October 2015).
 2. John T. Correll, "The Air Force in the Vietnam War", *Aerospace Education Foundation: Air Force Magazine*, December 2004, 25-26.
 3. H. Res 1605 – In the House of Representatives, U.S., Arlington, VA, 19 October, 2010.
 4. Maj Dalene D. Perdue, "Wait a Minute: I Didn't Sign Up for This!" (Maxwell AFB, AL: Air Command and Staff College, 2000), 3.
 5. Lt Col Linda J. Wyse, "Reserve Roles in Joint Medical Readiness," (Maxwell AFB, AL: Air War College, 1997), 21.
 6. Lt Col Robert S. Oates, "Total Force Integration: Reserve Component Associate Missions," (Maxwell AFB, AL: Air War College, 2008, 3, 13.
 7. Maj Robert I. Lowe, "Military Airlift Forces' Contributions to the Air-Sea Battle Concept for Combating Anti-Access/Area Denial Strategy," (Maxwell AFB, AL: Air Command and Staff College, 2013), 1.
 8. Maj Marie L. Berry, "Improving Interface between Aeromedical Evacuation and En Route Systems," (Maxwell AFB, AL: Air Command and Staff College, 2002), 6.
 9. William W. Hurd and John G. Jernigan, *Aeromedical Evacuation: Management of Acute and Stabilized Patients, Chapter 2, Aeromedical Evacuation: A Historical Perspective*, Kathleen Vanderburg, Springer, 2002, 6.
 10. Ibid, 6.
 11. Lt Col Brenda L. Reiter, "The History of Aeromedical Evacuation and the Emerging System of Tomorrow," The Industrial College of the Armed Forces, National Defense University, For McNair, Washington, D.C., 1993, 1,2.
 12. Ibid, 2.
 13. Hurd, *Aeromedical Evacuation*, 6.
 14. Reiter, The History of Aeromedical Evacuation, 2.
 15. Alan L. Peterson, Kelly R. McCarthy, Daniel Busheme, Rick Campise, and Monty Baker, *Combat and Operational Behavioral Health, Chapter 13: The Aeromedical Evacuation*, The Office of the Surgeon General, Borden Institute, Washington, DC, 2011, 192.
 16. Hurd, *Aeromedical Evacuation*, 8.
 17. Ibid, 8.
 18. Reiter, The History of Aeromedical Evacuation, 2.
 19. Peterson, *Combat and Operational Behavioral Health*, 192.
 20. Hurd, *Aeromedical Evacuation*, 8.
 21. Ibid, 8,9.
 22. Reiter, The History of Aeromedical Evacuation, 4.
 23. Ibid, 5.
 24. Ibid, 6.
 25. Hurd, *Aeromedical Evacuation*, 9.
 26. Ibid, 9.
 27. Anonymous, "Aeromedical Evacuation," *Air Power History*, Summer 2000, 38.
 28. Ibid, 39.
 29. Ibid, 38.
 30. Ibid, 39.

-
31. Vietnam War Fact Sheet, Air Force Medical Service, 21 Mar 2007, <http://www.airforcemedicine.af.mil/About/Fact-Sheets/Display/Article/425550/the-vietnam-war>, (Accessed 21 July 2016).
 32. Hurd, *Aeromedical Evacuation*, 10, 11.
 33. Col Jack Sariego, "Aeromedical Combat Casualty Evacuation from Vietnam to the Global War on Terrorism: Toward a 21st Century Paradigm Shift in Casualty Management," *The American Surgeon*, 23 Jun 2010, 2.
 34. American Forces Press Service, "Operation Homecoming for Vietnam POWs marks 40 Years," 12 February 2013, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/109716/operation-homecoming-for-vietnam-pows-marks-40-years.aspx> (Accessed 21 July 2016).
 35. 31 AES 1983 Historical Report.
 36. Brig Gen Bruce Green, USAF, "Challenges of the Aeromedical Evacuation System in the Post-Cold-War Era," *Aerospace Power Journal*, Winter 2001, 5.
 37. Ibid, 6.
 38. Ibid, 6.
 39. Ibid, 6.
 40. Defense Casualty Analysis system, Overseas Contingency Operations Conflict Casualty Report, 20 Jul 2016. https://www.dmdc.osd.mil/dcas/pages/report_sum_comp.xhtml, (Accessed 20 July 2016).
 41. 2008 Patient Movement Fact Sheet, USTRANSCOM, http://www.ustranscom.mil/cmd/associated/tcsg_public/files/2008_patient_movement_fact_sheet.pdf, (Accessed 21 Jul 2016).
 42. Joint Publication 4-02, *Heath Service Support*, Joint Chiefs of Staff, 26 July 2012, B-A-5.
 43. Ibid, B-A-5.
 44. Air Force Policy Directive 10-29, *Worldwide Aeromedical Evacuation Mission*, 6 November 2012.
 45. Air Force Instruction (AFI) 11-2AE Volume 3, *Aeromedical Evacuation Operations Procedures*, 15 Aug 2014, 115.
 46. Aeromedical Evacuation Training Plan, US Air Force Reserve Command, Robbins AFB, GA, 2015, 85.
 47. Air Force Instruction (AFI) 11-2AE Volume 3, 19.
 48. CCATT EIM Welcome Page, 3 Sept 2015, <https://www.my.af.mil/gcss-af/USAF/ep/contentView.do?contentType=EDITORIAL&contentId=c6925EC1802010FB5E044080020E329A9&channelPageId=s6925EC13493A0FB5E044080020E329A9&programId=t6925EC31FFAB0FB5E044080020E329A9>, (Accessed 6 July 2016).
 49. Air Force Instruction (AFI) 11-2AE Volume 3, 121,122.
 50. Aeromedical Evacuation Training Plan, US Air Force Reserve Command, Robbins AFB, GA, 2015, 74.
 51. Joint Publication 4-02, *Heath Service Support*, 26 July 2012, B-A-6.
 52. Aeromedical Evacuation Training Plan, US Air Force Reserve Command, Robbins AFB, GA, 2015, 22, 23.
 53. Cassie Archebelle, "Keesler Gains Aeromedical Evacuation Squadron," WSMV news online, <http://www.wsmv.com/story/32031039/keesler-gains-aeromedical-evacuation-squadron>, 21 May 2016, (Accessed 7 July 2016).
 54. Aeromedical Evacuation Training Plan, 23.

-
55. Frank W. Walbank, Alexander the Great: King of Macedonia, Encyclopedia Britannica Online, (<https://www.britannica.com/biography/Alexander-the-Great>), (Accessed 7 July 2016).
 56. Robert Burnham, Spanish Recruits in the British Army 1812-1813, Military Subjects: Organization, Strategy & Tactics, (http://www.napoleon-series.org/military/organization/c_spanish.html), (Accessed 7 July 2016).
 57. Dr. Chandrika Kaul, From Empire to Independence: The British Raj in India 1858-1947, BBC, 03 March 2011, http://www.bbc.co.uk/history/british/modern/independence1947_01.shtml, (Accessed 7 July 2016).
 58. Raphael S. Cohen, "Demystifying the Citizen Soldier," RAND Corporation, 2015, iv.
 59. Ibid, 3.
 60. U.S. National Guard, Legacy of the Guard, undated, <http://www.nationalguard.com/legacy>, (Accessed 21 July 2016).
 61. Cohen, "Demystifying the Citizen Soldier," 18.
 62. Alice R. Buchalter, "Historical Attempts to Reorganize the Reserve Components," Federal Research Division, Library of Congress, Washington, D.C., 2007, 1,2.
 63. Ibid, 14.
 64. Cohen, "Demystifying the Citizen Soldier," 28.
 65. Jacob Alex Klerman, "Rethinking the Reserves," RAND Corporation, 2008, xi.
 66. Dennis P. Duffy, "The Past, Present, and Future of the Air Force's Future Total Force," (Wright Patterson AFB, Ohio: Air Force Institute of Technology, June 2004), 12.
 67. Buchalter, "Historical Attempts to Reorganize," 5.
 68. Ibid, 15.
 69. Ibid, 15.
 70. Duffy, "The Past, Present, and Future," 14,15.
 71. Duffy, "The Past, Present, and Future," 13.
 72. Ibid, 12.
 73. Duffy, "The Past, Present, and Future," 19.
 74. Dr. James Malachowski, "*Air Force Reserve Command Year in Review*," Air Force Reserve Command History Office, 2015, 54.
 75. National Guard Bureau, "2017 National Guard Bureau Posture Statement, 2016, 6,7.
 76. Duffy, "The Past, Present, and Future," 19.
 77. Cohen, "Demystifying the Citizen Soldier," 18,23.
 78. Andrew Krepinevich, Barry Watts & Robert Work, "Meeting the Anti-Access and Area-Denial Challenge," Center for Strategic and Budgetary Assessments, 2003, ii.
 79. Robert Gates, Quadrennial Defense Review Report, February 2010, 31.
 80. Ibid, 32,33.
 81. Chuck Hagel, Quadrennial Defense Review Report, February 2014, vii.
 82. Ibid, 28.
 83. Joint Chiefs of Staff, The National Military Strategy of the United States of America 2015, June 2015, 6.
 84. Education & Training Course Announcements, RCOT, COT, SERE, Water Survival, AEIQ, and AET.
 85. Education & Training Course Announcements, BMT, 4N0X1 Tech School, SERE, Water Survival, AEIQ, and AET.

-
86. Air Force Instruction (AFI) 11-402, *Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges*, 13 December 2010, 117-118.
 87. Education & Training Course Announcements, S-V80-A SERE Course Description, 336 TRSS/OSFA, 16 Mar 2016.
 88. Education & Training Course Announcements, S-V88-AL Evasion and Conduct After Capture – Lackland, HQ AETC/A3QS, 10 Mar 2016.
 89. Sustainment Training to Advance Readiness Skills Knowledge Exchange Website, <https://kx.afms.mil/kj/kx3/STARS/Pages/home.aspx>, (Accessed 11 Aug 2016).
 90. Ibid.
 91. History, 315th Aeromedical Evacuation Squadron, 2001 – 2014.
 92. Stanley Kubrick, *Full Metal Jacket*, 1987.
 93. Col Diane DiFrancesco (Commander 315 AES, former commander 445 EAES, Bagram AB, Afghanistan), interview by the author, 09 Aug 2016.
 94. Aeromedical Evacuation: Current and Future States PowerPoint, AMC En Route Medical Care Division, 26 Jul 2016, 15.
 95. Air Force Special Tactics Wing (24 SOW) Webpage, <http://www.24sow.af.mil/SpecialTactics.aspx>, (Accessed 11 Aug 2016)
 96. Air Force Doctrine, Annex 4-02 En Route Casualty Care System, 29 September 2015, 3.
 97. Aeromedical Evacuation: Current and Future States, 26 Jul 2016, 4.
 98. Ibid., 12.
 99. Ibid., 23.



BIBLIOGRAPHY

“Aeromedical Evacuation.” *Air Power History*, Summer 2000.

AFRC/A3MA. *Aeromedical Evacuation Training Plan*, 2015.

-
- Air Force Doctrine, Annex 4-02. *En Route Casualty Care System*, 29 September 2015.
- Air Force Instruction (AFI) 11-2AE Volume 3. *Aeromedical Evacuation Operations Procedures*, 15 August 2014.
- Air Force Instruction (AFI) 11-402. *Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges*, 13 December 2010.
- Air Force Medical Service. Vietnam War Fact Sheet, 21 Mar 2007,
<http://www.airforcemedicine.af.mil/About/Fact-Sheets/Display/Article/425550/the-vietnam-war> (Accessed 21 July 2016).
- Air Force Policy Directive (AFPD) 10-29. *Worldwide Aeromedical Evacuation Mission*, 6 November 2012.
- Air Force Special Tactics Wing (24 SOW) Webpage,
<http://www.24sow.af.mil/SpecialTactics.aspx>, (Accessed 11 Aug 2016).
- Air Force Tactics, Techniques, and Procedures, 3-42.5. *Aeromedical Evacuation*, 1 November 2003.
- American Forces Press Service. Operation Homecoming for Vietnam POWs marks 40 Years, 12 February 2013,
<http://www.af.mil/News/ArticleDisplay/tabid/223/Article/109716/operation-homecoming-for-vietnam-pows-marks-40-years.aspx> (Accessed 21 July 2016).
- Aeromedical Evacuation: Current and Future States PowerPoint. AMC En Route Medical Care Division, 26 Jul 2016.
- Archebelle, Cassie. "Keesler Gains Aeromedical Evacuation Squadron." *WSMV news online*, 21 May 2016. <http://www.wsmv.com/story/32031039/keesler-gains-aeromedical-evacuation-squadron> (Accessed 7 July 2016).
- Berry, Maj Marie L. "Improving Interface between Aeromedical Evacuation and En Route Systems." Maxwell AFB, AL: Air Command and Staff College, 2002.
- Buchalter, Alice R. *Historical Attempts to Reorganize the Reserve Components*. Washington, D.C.: Federal Research Division, Library of Congress, 2007.
- CCATT EIM Welcome Page, 3 Sept 2015, <https://www.my.af.mil/gcssaf/USAF/ep/contentView.do?contentType=EDITORIAL&contentId=c6925EC1802010FB5E044080020E329A9&channelPageId=s6925EC13493A0FB5E044080020E329A9&programId=t6925EC31FFAB0FB5E044080020E329A9>, (Accessed 6 July 2016).
- Clingman, Capt Fred, M. *Analysis of Aeromedical Evacuation in the Korean War and Vietnam*

-
- War. School of Systems and Logistics, AFIT/GLM/LS/89S-9. Wright- Patterson AFB, OH: Air Force Institute of Technology, 1989.
- Cohen, Raphael S. "Demystifying the Citizen Soldier," RAND Corporation, 2015.
- Congressional Research Service. *Pivot to the Pacific? The Obama Administration's "Rebalancing" Toward Asia*. Washington DC: Government Printing Office, 2012.
- Correll, John T., "The Air Force in the Vietnam War", Aerospace Education Foundation: *Air Force Magazine*, December 2004, 25-26.
- Defense Casualty Analysis System. *Overseas Contingency Operations Conflict Casualty Report*, 20 Jul 2016. https://www.dmdc.osd.mil/dcas/pages/report_sum_comp.xhtml (Accessed 20 July 2016).
- Dempsey, Gen Martin E., Chairman Joint Chiefs of Staff. *Joint Operational Access Concept (JOAC)*. Washington, DC, January 2012.
- Department of the Navy. *A Cooperative Strategy for 21st Century Seapower*, March 2015.
- Duffy, Dennis P. "The Past, Present, and Future of the Air Force's Future Total Force." Wright Patterson AFB AFB, Ohio: Air Force Institute of Technology, June 2004.
- Education & Training Course Announcements, S-V80-A SERE Course Description, 336 TRSS/OSFA, 16 Mar 2016.
- Education & Training Course Announcements, S-V88-AL Evasion and Conduct After Capture – Lackland, HQ AETC/A3QS, 10 Mar 2016.
- Gates, Robert. Quadrennial Defense Review Report, February 2010.
- Green, Brig Gen Bruce. "Challenges of Aeromedical Evacuation in the Post-Cold-War Era." *Aerospace Power Journal*, Volume 15, Number 4, (Winter 2001): [14-26].
- Hagel, Chuck. Quadrennial Defense Review Report, February 2014.
- History. Air Force Reserve Command, 1 Jan – 31 Dec 2014.
- History. 31st Aeromedical Evacuation Squadron, 1 Jan – 31 December 1983.
- US House Armed Services Committee. AE Crew Recognition. 111 Cong., H.R. 1605, (28 Sept 2016).
- Hurd, William, W., and John G. Jernigan, *Aeromedical Evacuation: Management of Acute and Stabilized Patients*, Chapter 2, *Aeromedical Evacuation: A Historical Perspective*. New York City, NY: Springer-Verlag, 2003.

Joint Chiefs of Staff, *The National Military Strategy of the United States of America* 2015, June 2015.

Joint Publication 4-02, *Health Service Support*, 26 July 2012.

Klerman, Jacob A. "Rethinking the Reserves," RAND Corporation, 2008.

Krepinevich, Andrew, Barry Watts & Robert Work, "Meeting the Anti-Access and Area-Denial Challenge," Center for Strategic and Budgetary Assessments, 2003.

Kubrick, Stanley. *Full Metal Jacket*. Warner Bros. 118 min., 1987. Digital Video Disk.

Lowe, Maj Robert, I. "Military Airlift Forces' Contributions to the Air-Sea Battle Concept for Combating Anti-Access/Area Denial Strategy." Maxwell AFB, AL: Air Command and Staff College, 2013.

Malachowski, Dr. James. "Air Force Reserve Command Year in Review," Air Force Reserve Command History Office, 2015.

National Guard Bureau. "2017 National Guard Bureau Posture Statement," 2016.

National Guard Bureau, Legacy of the Guard. Undated, <http://www.nationalguard.com/legacy> (Accessed 21 July 2016).

Oates, Lt Col Robert S. "Total Force Integration: Reserve Component Associate Missions." Maxwell AFB AL: Air War College, 2008.

Perdue, Maj Dalene D. "Wait a Minute: I Didn't Sign Up for This!" Maxwell AFB, AL: Air Command and Staff College, 2000.

Peterson, Alan L., Kelly R. McCarthy, Daniel Busheme, and Rick Campise, and Monty Baker. *Combat and Operational Behavioral Health, Chapter 13: The Aeromedical Evacuation*. Washington, DC: The Office of the Surgeon General, 2011.

Thie, Harry J., Raymond E. Conley, Henry A. Leonard, Megan Abbott, and Eric V. Larson. *Past and Future, Insights for Reserve Component Use*. Santa Monica, CA: RAND Corporation, September 2004.

Reiter, Lt Col Brenda, L. *The History of Aeromedical Evacuation and the Emerging System of Tomorrow*. Industrial College of the Armed Forces, NDU-ICAF-93-S64. Washington, DC: National Defense University, 1993.

Sariego, Col Jack. "Aeromedical Combat Casualty Evacuation from Vietnam to the Global War on Terrorism: Toward a 21st Century Paradigm Shift in Casualty Management." *The American Surgeon*, 23 Jun 2010.

Sustainment Training to Advance Readiness Skills Knowledge Exchange Website,
<https://kx.afms.mil/kj/kx3/STARS/Pages/home.aspx>, (Accessed 11 Aug 2016).

USTRANSCOM, 2008 Patient Movement Fact Sheet,
http://www.ustranscom.mil/cmd/associated/tcsg_public/files/2008_patient_movement_fact_sheet.pdf, (Accessed 21 Jul 2016).

World War II Foundation, “WWII Aircraft Facts”, 2014,
<http://www.wwiifoundation.org/students/wwii-aircraft-facts/> (accessed 13 October 2015).

Wyse, Lt Col Linda J. “Reserve Roles in Joint Medical Readiness.” Maxwell AFB, AL: Air War College, 1997.

