Military Orthopaedics

Wartime orthopaedic residency: a resident's perspective

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ABSTRACT

The terrorist attacks of September 11, 2001, and the ensuing war on terror including major conflicts in Iraq and Afghanistan have lead to changes in many aspects of the world. This is true even in medical education, and the experiences of current residents and recent graduates have been affected in many ways, developing the field of orthopaedic surgery and its practitioners in areas of technical innovation, military experience, personal maturity and a sense of duty while providing opportunities for mentorship and interservice collaboration. The authors present their unique experiences as a prior Marine Corps Officer and General Medical Officer and the benefits of orthopaedic residency training in military training facilities during a time of conflict.

Key Words
combat, education, leadership, military, residency, wartime

INTRODUCTION

"Train like we fight." This popular slogan is a concept embraced primarily in our military warfighting specialties. In the civilian medical field, most orthopaedic specialty training happens during the day-to-day grind of residency education while the fight looms ahead—practicing independently as a staff surgeon. In the military medical field, the learning model is similar but the pathway, environment, patient population, and end goal are much different. Our fight often is more literal, practicing orthopaedics in the battle-torn soils of foreign lands. The potential of deploying in harm's way is a very real prospect understood by all men and women who sign up to serve their country both during times of conflict and times of peace. It is a filter that selects for the men and women we want in our ranks. Some wonder why a physician would willingly volunteer for this duty and how the training would differ from civilian orthopaedic programs. The authors submit that, in general, military residency programs are very similar to those found in the civilian sector and are held to the same Accreditation Council for Graduate Medical Education (ACGME) goals and guidelines. There are, however, many aspects of military medical training unique to our experience. Wartime training provides opportunities for education and growth unique to military residency programs. We present some of our experiences and key traits that wartime residency has helped forge in the residents currently being trained and those who have recently graduated.

INNOVATION

It is postulated that when Dr. Samuel Prescott cared for Minute Men wounded in the Battle of the Bridge in April of 1775, he became the first American military medical officer. Additionally, his home could be considered the first United States Army Hospital.[1] From this point in history, Americans have endured multiple wars and armed conflicts, each delivering their own set of devastating and challenging orthopaedic injuries, resulting in innovative medical solutions. A literature review demonstrates remarkable advances in fracture management, internal and external fixation, wound management, limb salvage, and amputee care, all forged from the need to provide higher quality care for our wounded warriors.[2,3••,4•,5] Training during a time of conflict has enhanced and focused the authors' realization that necessity really does drive innovation. Furthermore, training at military treatment facilities has provided the authors the opportunity to participate in combat care-related research that has led to instrumental changes in how we treat our wounded warriors.

EXPERIENCE

Military orthopaedics attracts many of those who have previously served in a nonmedical capacity within the United States Armed Forces. Four of the authors were service academy graduates, one of whom (JB) began his career as a United States Marine Corps officer upon graduation from the Naval Academy in 1998. He has had the benefit of military training both during peacetime and in wartime environments. His first formal Marine Corps training was at The Basic School (TBS) in Quantico, VA. TBS is a rigorous 6-month training where all Marine Corps officers are taught

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Consent: A release of information for release of information was obtained and signed by the patient.
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how to be expert leaders and marksmen, earning the title of Marine. America was in a relative time of peace and only a handful of his instructors had any real combat experience. Although training still followed the ''train like we fight'' mantra, there was no active conflict awaiting TBS graduates. Today, the halls of TBS are filled with battle-proven leaders and young newly commissioned Second Lieutenants absorbing every piece of advice they can because they know that in a few short months they likely will be sent to a hostile combat zone. No matter how hard you try to simulate this environment during peacetime, it is not the same. After serving in the Marine Corps for 6 years, the same author is now a senior resident in the Navy Orthopaedic Surgery program at Naval Medical Center San Diego (NMCSD). Leadership skills and experience gained in the Marine Corps have helped him to succeed in orthopaedics and to empathize and relate to those active duty service members now under his care. In contrast to his Marine Corps training, all of his medical training has been since the start of the War on Terror and conflicts in both Afghanistan and Iraq. The majority of his teachers, mentors, and patients have seen combat, and this is military medical training at its finest.

The senior author (TM) is a recent wartime residency graduate from the Navy's residency program at National Naval Medical Center (NNMC), Bethesda, MD—now part of a joint Navy and Army residency program (Walter Reed National Military Medical Center). National Naval Medical Center and Walter Reed Army Medical Center had been identified as the hub for wartime trauma transit. Logistically, this meant all Critical Care Air Transport (CCAT) patients were routed through these two hospitals. Most Sunday, Tuesday, and Friday nights he saw medical evacuations (medevacs) arrive from combat locations overseas. The orthopaedic surgery junior residents prided themselves in being uniquely attuned to the medevac manifest. Discovering the number of medevacs and any information of injuries sustained led to a quick calculation of the coming night's work. The complex array of tasks included obtaining patient histories, performing physical examinations and dressing changes, placing splints, ordering imaging, scheduling surgeries all the while considering required implant or external fixator devices, necessary blood products, peripheral nerve blocks, and angiograms for free flap planning. This process was made seemingly effortless by the ever more capable residents and staff at these institutions.

Years of residency training caring for wounded warriors at The Walter Reed National Military Medical Center has led to a generation of military service-trained orthopaedic surgeons with a unique ability to make a gestalt assessment of the salvageability of blast-related mangled limbs in a timely fashion. Free flaps are being performed either independently by the orthopaedic trauma teams or in collaboration with the plastic surgery services, contributing greatly to the training of residents in both soft-tissue management and the reconstructive ladder. Admittedly, there are only a set amount of hours to train during orthopaedic residency, and this war trauma saturated experience has had a variable effect on our military training programs. In the senior author's case, this meant graduating with a lower arthroplasty caseload compared with most of his civilian counterparts. This challenge has lead to innovative methods of ensuring comprehensive orthopaedic training for military residents including physician-extenders, local community support, and partnership with civilian surgery centers. Consequently, military programs are graduating board-certified surgeons with excellent general orthopaedic training and the ability to be immediately deployed and function independently in austere combat, war-torn, and humanitarian environments. The senior author tested his training recently when deployed in support of Continuing Promise 2011, a humanitarian mission onboard the United States Naval Ship (USNS) Comfort. This ship-based hospital was the most readily available care to several blast-related lower extremity injuries sustained by field workers in South America who strayed into hostile, mine-laden cocaine growing fields. His residency experiences guided him in the critical focused preoperative examination elements so that once surgically debrided, the assessment of soft-tissue loss and the need for coverage, vascular status, bone loss, and articular involvement could all be predictively summarized for the limb's salvageability at the index visit. The end result was a timely discussion with the patient, family, host country, and ship's management for prognosis and future management direction.

MATURITY

Two of the authors (RW and LM) took different routes to achieve the same end goal of being selected for and completing orthopaedic residencies. Historically, after completion of an internship and before starting an orthopaedic residency, most Navy personnel spend 1–3 years as general medical officers onboard ships, as undersea medical officers, as flight surgeons, or imbedded with Marine Corps units. During this time much growth occurs. Practitioners learn to practice medicine without the safety net provided in residency, which teaches responsibility for patient care, decisiveness, and, ultimately, maturity as a physician. While forward deployed to combat zones in support of Operation Iraqi Freedom, these two authors not only ran their own clinics in austere environments but also had the opportunity to travel throughout the country providing both operational and medical support. They worked as flight crews alongside their Marine Corps counterparts, participating in combat support missions, allowing them to understand the operational thought process, develop strong bonds with the pilots, aircrew, maintainers, and support personnel, and helped them to mature as individuals. It was also a first-hand view of the mental and physical stresses endured by our service members throughout a combat deployment, helping to better understand and empathize with them when they return home.

The authors had the opportunity to hone their teaching skills by instructing Marines with basic lifesaving courses and training Navy Corpsmen and Army Medics with ''sick-call screening courses.'' These unique interactions across service lines cemented the importance of embracing cultural differences between the various military branches to thrive as young medical officers. Additionally, the experience of working alongside Navy and Army orthopaedic surgeons at

the combat surgical hospitals, providing emergency trauma care to injured servicemen helped cement orthopaedics as the clear and correct career choice for these authors. They grew in military competence, medical confidence, and overall maturity, characteristics that have helped in their current roles as orthopaedic residents.

MENTORSHIP

There are several organizations that mentor a select few practitioners who have proven that they will become leaders in orthopaedics. They function in a similar manner to successful business organizations, with an overarching goal to ensure that the ''vision or mission'' of the organization endures. Military orthopaedics operates similarly, but with a unique vested interest in all of its graduates. Five years after starting an orthopaedic residency, a new graduate does not drive away, seeing the military hospital in their rear view mirror, never looking back. In fact, the experience is quite the contrary for us.

Many residents, especially those who received commissions from military service academies or Reserve Officers Training Corps programs have already dedicated up to 10 years to active duty service and incur an additional obligation upon completion of residency. This is important because it means that we will all be part of a relatively small military family for at least the early part of our orthopaedic careers. As such, it is fertile ground for mentorship to ensure that the vision and mission of military orthopaedics endures. The mentor passes on knowledge gained from prior deployments, humanitarian missions, and experiences practicing at other military treatment facilities, all above and beyond what can be passed on regarding ''the practice of orthopaedics.'' This often is of significant value to residents and junior orthopaedic surgeons, because many of these lessons cannot be learned by opening a book.

COLLABORATION

It is ever more common to have patients of different military services seek care at our major military hospitals throughout the country and world. As an example, an Army patient may need orthopaedic care at the Naval Hospital in San Diego because he is on vacation in the region or involved in a local military training exercise. It is, therefore, important that Navy providers are comfortable with other service's rules and regulations, rank structure, and referral hospital network to best treat this military service member and return him to his operational unit. The same is true between other services and other locations around the globe, and there is nowhere that this is more important than on the battlefields of Iraq and Afghanistan. It is common to be deployed overseas as the orthopaedic surgeon to another military service's hospital. Although this forces joint service collaboration, it is better to start this process at home. In fact, two military residencies have already become joint service residencies; one in the Washington, D.C. area (Walter Reed National Military Medical Center — Navy and Army) and the other in San Antonio, TX (San Antonio Uniformed Services Health Education Consortium — Army and Air Force).

Since 1958, military orthopaedic surgeons from the Navy, Army, and Air Force have been meeting annually to discuss the practice of orthopaedic surgery in the military. The annual meeting for the Society of Military Orthopaedic Surgeons (SOMOS) has grown into our flagship military orthopaedic scientific conference where we share military service and orthopaedic specialty-specific knowledge in a critical but constructive setting. Through this organization, the doors have been opened to large-scale, inter-service collaborative research, which we hope will help answer some of the difficult clinical questions that remain unanswered.

CONCLUSION

If you talk to those who wear the military uniform and have made the choice to practice military medicine, they will tell you they do it for the patients. We provide orthopaedic care to the heroes of this nation, to the individuals who have willingly sacrificed so much for all of us and who deserve the best care as they recover from their injuries. It is a great honor and privilege to do what we do. In September of 2007, Lieutenant Jason Redman, US Navy SEAL, came under heavy machine gun fire during combat operations in Iraq. He was seriously injured and ultimately transferred to National Naval Medical Center, Bethesda, MD for advanced medical care. The lead author (JB) had the privilege of being part of his orthopaedic team as a fourth year medical student. One morning, when rounding, there was a note written by Lieutenant Redman on bright orange paper nailed to his hospital door by his Navy SEAL warfare device (otherwise known as Budweiser). This manifesto read:

''ATTENTION TO ALL WHO ENTER HERE. If you are coming into this room with sorrow or to feel sorry for my wounds, GO ELSEWHERE. The wounds I received, I got in a job I love, doing it for people I love, supporting the freedom of a country I deeply love. I am incredibly tough and will make a full recovery. What is full? That is the absolute utmost physically my body has the ability to recover. Then I will push that about 20% further through sheer mental tenacity. This room you are about to enter is a room of fun, optimism, and intense rapid regrowth. If you are not prepared for that, GO ELSEWHERE. From: The Management.''

(Redman J. Personal communication, 2012)

This statement pays testament to the fact that duty is in no way unique to the surgeon alone. We thrive off the unwavering dedication and resilience of our patients and thank all those who give us the honor to serve.

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- • of special interest
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