



The USS *George Washington* medical department:
Medicine in motion

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LT Harwood standing in front of an F/A-18F.



Being on the open ocean in any vessel is a unique experience that relatively few will ever be able to experience. Having this experience while delivering superb medical care onboard a Nimitz-class aircraft carrier, history's largest war-fighting ship, is an experience worth sharing. The purpose of this article is to introduce life on the USS *George Washington*, with emphasis on the medical department and some of the challenges staff members face. The authors hope to provide some additional insight into this modern marvel and its ability to provide world-class medical care under exceptional circumstances.

The aircraft carrier

Since shortly after the advent of fixed-wing flight at the beginning of the twentieth century, aircraft have been flying off the decks of ships. The first launch of a plane from a stationary ship occurred in 1910, piloted by a civilian named Eugene Ely. The feat took place in Hampton Roads, VA, off of the U.S. Navy cruiser, the USS *Birmingham*.¹

Opposite: The USS *George Washington* steams through the Pacific Ocean. (U.S. Navy photo by Mass Communication Specialist Seaman Adam K. Thomas). Other photos courtesy of the author.

There have been many refinements and changes since that time, and today's aircraft carriers are very different from those used in famous battles such as the Battle of Midway. For example, the sole survivor of the Yorktown-class aircraft carriers, the USS *Enterprise* (CVN-6), displaced 25,900 tons of water with a full load.² Comparatively, the Nimitz-class supercarriers of the current U.S. Navy are much larger, displacing approximately four times as much water.³ They also feature improvements such as an angled flight deck, nuclear propulsion, and modern weapons/navigational systems that enhance their capabilities.

The aircraft carrier is a symbol of power and has served a vital role in all of the nation's major conflicts, offering a sustainable strike capability on very short notice. This comes at a price, however. With an annual operating budget of approximately \$450 million, over its lifetime of 50 years, a single nuclear aircraft carrier will cost the U.S. more than \$22 billion.⁴

Though an aircraft carrier has an impressive amount of firepower, much of it is wrapped up in its aircraft. Therefore, the primary mission of the aircraft carrier is offensive firepower. Aircraft carriers have traditionally been escorted by an entourage of other ships and submarines



The inpatient ward. When the beds are not being used, they can be folded up or removed to allow space for other things.

to minimize vulnerabilities. The primary role of these escorts is to protect the aircraft carrier against air, surface, and subsurface threats. This group of ships, classically referred to as a Carrier Battle Group, is now called a Carrier Strike Group or CSG. Our CSG is headed by Rear Admiral Dan Cloyd, who will be moving on to his next assignment shortly. He will be replaced by Rear Admiral John R. Haley.

CVN-73

The USS *George Washington* (CVN-73), affectionately known as “G.W.” or “G-Dub” by her crew, is the sixth ship in the Nimitz-class of nuclear-powered supercarriers. The aircraft carrier was built by Newport News Shipbuilding; was commissioned July 4, 1992; and is commanded by CAPT David A. Lausman, one of only 11 such captains in the world currently commanding a U.S. nuclear powered aircraft carrier.

Carrier Air Wing Five

Carrier Air Wing Five (CVW-5) was originally commissioned in 1943 as Carrier Air Group 5 (CVG-5), and was homeported out of San Diego, CA. The aircraft carrier saw early action in the Pacific Theatre of World War II, and has served in the Korean War, the Gulf War, and, today, the war on terrorism.

CVG-5 was redesignated in 1963 as CVW-5, and the aircraft carrier made history a decade later in 1973, when it embarked on the USS *Midway* and became the first carrier/air wing team to be permanently forward deployed overseas.⁵ CVW-5, now aboard the USS *George Washington*, continues to hold this distinction today.

The medical department

With approximately 10,000 personnel on the move during multi-country military exercises, a medical department equipped to address this unique challenge is a necessity. The medical division’s mission of providing world-class medical care to each of our dependents never changes, although the tasks at hand do vary from day to day. The medical staff has to be capable of responding to mass casualties, treating critically ill patients for prolonged periods, and transporting patients quickly, when feasible. Unlike medical facilities on the ground, a number of factors change continuously aboard an aircraft carrier, necessitating the cooperation of many parties to optimize medical care. Collaboration is required and utilized whether inside the department, the ship, the battle group, the region, or hospitals and providers several thousand miles away. Coordination involves U.S. military, American assets, allied military units, international medical evacuation firms, and foreign civilian health care facilities.

Of the 17 departments onboard the USS *George Washington*, the medical department, which the medical division shares with the dental division, is one of the smaller groups onboard, with approximately 50 personnel. The staff comes from all four corners of the U.S. and are of different economic backgrounds, ethnicity, and gender.

With so much metal and movement around, people are bound to hurt themselves. Wound care, lacerations, and contusions accounted for almost 40 percent of our emergency room visits in 2008. In fact, the size of the ship or number of its aircraft are not the only impressive statistics: in 2008, the medical division drew 26,914 labs, had 15,372 outpatient

The operating room on board the
USS *George Washington*.



visits, filled 9,969 prescriptions, took 2,312 X rays, and performed 65 operations.

The ship's surgeon

The surgical team on the G.W. includes a general surgeon, an anesthesiologist or nurse anesthetist, two surgical technicians, and a critical care nurse. The ship features one main operating room with basic laparoscopic gear and gastrointestinal endoscopy instruments. In a mass casualty situation, the surgical team can run two operating rooms along with the oral and maxillofacial surgeon. The main goal of the surgical team is to provide damage control surgery for severely injured patients.

When flight deck operations are going on, there is always potential for mass casualties. At the peak of flight operations, planes are launched and recovered at a very quick pace. At any given time during the flight operations, there are approximately 200 sailors on the flight deck, where planes are taking off, landing, or being moved around. Even a simple mistake can result in a catastrophe, and the surgical team is on standby 24/7 for any such incident. The medical team's goal is to stabilize the patient, stop the bleeding, stop spillage, and evacuate the patient to the nearest hospital at the earliest opportunity.

Hand injuries are common; often the hand is crushed during the closing of hatches or in machinery workshops. The most common non-trauma emergency surgery is appendectomy. Though the medical team has the instrumentation for laparoscopic appendectomy, the preferred method is to perform the procedure open. The surgeon also performs a limited range of elective surgery, including groin hernia repair, anorectal procedures, and vasectomies. Providing postop-

erative care for anorectal procedures with sitz baths is challenging on board the aircraft carrier. When traveling through rough waters, the ship heaves up and down significantly, and so performing surgery while maintaining balance becomes second nature.

We teach corpsmen surgical skills like cleansing dirty wounds, suturing lacerations, and stabilizing fractures. These skills will likely be utilized when some of the corpsmen deploy with Marine ground troops and become first responders. Patients are kept longer on the ward postoperatively than in most hospitals, due to the fact that climbing ladder wells is painful. The medical team has to take these additional variables into account when considering patient disposition.

The electrical systems have multiple backups and have never failed. Whether scheduling elective surgeries or crash prepping for emergencies, the supply of consumable items is sometimes stressed. When an item runs out, the medical team does not have the luxury of ordering it overnight via Federal Express. The medical team spends considerable time before each underway period to ensure our supplies will last through that period, which is usually four to six months. If an item is running low during an underway period, it is possible to request a resupply; however, it takes time for the supplies to arrive, often weeks to months.

Keeping broad surgical skills intact in the existing environment is difficult. To mitigate the problem, the surgeon spends time at naval hospitals when the ship is in port for extended periods of time and undergoing repairs. In addition, prior to boarding the ship, each member of the department's core staff attends an annual trauma skills refresher course at the Navy Trauma Training

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Sunset on board
the flightdeck of
the USS *George
Washington*.



The USS *George Washington* pulling into its homeport, Yokosuka, Japan, for the first time.

Center located in the Los Angeles County and University of Southern California Medical Center.

The flight surgeon: Neither surgeon nor pilot

Naval flight surgeons are assigned to squadrons in both the Navy and Marine Corps. Despite the common misnomer, flight surgeons do not perform surgeries in flight. Instead, they serve as the general doctors for the squadrons, specializing in aviation medicine as it pertains to those individuals who fly. In essence, flight surgeons are in charge of maintaining the medical readiness of the air wing.

Flight involves several variables/forces that have their own set of unique medical conditions. Flight surgeons are sent to the Naval Aerospace Medical Institute in Pensacola, FL, for a six-month course during which they experience three phases of training: ground school (the same material that all Navy/Marine aviators learn); an abbreviated flight syllabus with flights in both fixed-wing and rotary-wing aircraft; and the flight physiology involved in aviation medicine. Topics studied include G-force-induced loss of consciousness, hypoxia, fatigue, and aeromedical waivers. There have traditionally been three classes of approximately 30 flight surgeons each per year.

A flight surgeon's time is scheduled to allow 50 percent of his or her time in the clinic and 50 percent of his or her time embedded in the squadrons. A big part of being a flight surgeon is forming relationships with those he or she treats, resulting in patients being open and honest about any medical issues that arise. In as unforgiving an environment as naval aviation, it is imperative that everyone in the air wing, regardless of rank or rate, is healthy and focused.

Another important responsibility of the flight

surgeon is to serve on several different safety boards, especially the mishap safety review boards in charge of investigating the causal factors of major mishaps. These safety review boards will submit a safety investigation report (SIR) to the Navy Safety Center that addresses the causal factors in detail to help prevent the same thing from happening again. One of the most important sections in the SIR is the aeromedical analysis in which human factors—those causal elements that involve or induce human error, the most common of which is fatigue—are discussed. Flight surgeons serve as subject matter experts for human factors, which account for a large majority of mishap causal factors.

A day in medical

A typical day in the medical department aboard the USS *George Washington* starts with the morning muster (gathering) of medical staff at 0715, where information is passed up and down the chain of command, and the plan of the day is discussed. The muster is immediately followed by the “executive officer’s happy hour.” This, by no means, consists of indulging in free or cheap drinks or coffee. In fact, at this point, every one participates in the cleaning of the ship, for a period of one hour. After making sure that the ship is spic and span, corpsmen get ready for patients who begin arriving, and continue to do so for the remainder of the day.

With our staff of doctors, we have all the required expertise to stabilize and treat even very complex conditions. The medical department has all the ancillary services that one would expect to find in a small community hospital, including a full pharmacy, laboratory, plain film X rays, operating room, and inpatient and intensive care wards. The department also has other vital

ancillary services, including radiation health, optometry, preventative health, mental health, and physical therapy.

Typically, days in the medical department are almost always bustling with activity; the variable is whether time is spent taking care of routine health problems or an unexpected medical emergency. The dreaded call message consists of the words “Medical emergency. Medical emergency in...” as the away team is directed to the site. Once this message is announced, the corpsmen grab a gurney and their bag and run out the hatch. However, locating the patient can sometimes be a challenging task on such a large ship. After the patient is located, the military police secure a safe route back down to the medical department. Whether it is a patient who has been blown into an aircraft by a jet blast on the flight deck, or a patient pinned against the bulkhead by a heavy forklift, the human body tends to lose the battle against cold hard steel.

Once the advance team assesses the patient and finds the patient stable enough to bring him or her to medical on their own power, they are helped up or down the ladder wells. There are 10 decks above, and almost that many decks below, the hanger bay. Helping a patient up or down the ladder wells is a challenge. If the patient has to be brought on a stretcher to medical, the logistics are more complicated. The ship is made for war fighting, not for patient transport. At 45 degrees, the ladder wells are steep, and they are narrow. Navigating the stretcher on the ladder wells is potentially dangerous for the corpsmen

as well as the patients. Patients who are being pulled from deeper spaces are sometimes hoisted up several decks through hatches.

One might wonder what ever happened to the elevators we all take for granted in tall buildings. In fact, the aircraft carrier does have a limited number of elevators that are used for transporting planes and ordnance. However, if the flight operations are in progress, hijacking one of the elevators will easily bring the entire process to a screeching halt. The flight operations amount to a carefully choreographed interplay involving hundreds of sailors and dozens of planes. (Flight operations are halted with the permission of the captain of the ship, if the situation requires such action.) Even seemingly simple tasks, such as transporting a patient via stretcher, require careful planning on an aircraft carrier.

Meanwhile, much of the medical department converges on the emergency room and prepares it to receive the casualty, prepping IVs, test tubes, monitors, and so on. Once the patient arrives, he or she is quickly assessed and treated by the team, which usually consists of the duty provider and several corpsmen, including those needed for ancillary services like the laboratory.

There are conditions outside the scope of our care. We will often coordinate with naval and civilian medical facilities in the various locations we port to facilitate referrals to different specialties. Though our sailors do occasionally have to wait for logistics to work out, we are able to maintain standard of care to mimic closely what is available on the beach (shore).

Medical evacuation (medevac)


Operational medicine often requires a degree of improvisation. Even though the medical team on an air wing is not operating in the middle of a desert during combat, the open ocean can be every bit as desolate when the surgeon has exhausted his or her medical capabilities. One such case last year involved a young sailor with acute aspiration pneumonitis. He required a medevac on a ventilator to the nearest naval hospital, which at that point was Guam. It required putting the patient in the back of a cargo plane on a stretcher. LT Harwood (a coauthor of this article) and a search and rescue corpsman

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accompanied the patient to the facility in Guam. Fortunately, there was a portable ventilator available for use, but the unknown variable was how long each oxygen canister would last. The team conducted some calculations with the assistance of the nurse anesthetist and took approximately twice the amount of what was considered necessary for the journey (nine canisters in total). Another variable that needed to be considered had to do with whether the patient could withstand the “catapult shot” it would take to lift him off. Both the corpsman and LT Harwood would have to be strapped into their seats during the catapult shot, and would be unable to attend to the patient until the plane was safely in the air. Fortunately, the patient’s oxygen saturation was stable throughout the flight, and the physicians ended up only needing to replace the oxygen canister three times. The team was humbly reminded of the necessity to be creative at every step of the process, in order to transfer a patient on a plane that accelerates from 0 to 150 miles in two seconds during take off.

Conclusion

Life at sea is a dynamic experience, and serving aboard the USS *George Washington* involves many challenges. These challenges are met with honor, courage, and commitment, thus fulfilling the Navy’s core values every day. For those up to the challenge, G.W., affectionately called “Mom,” takes her crew, including her medical staff, from one point in our lives to another, arriving at our destination as better men and women ready to serve society’s needs. 

Disclaimer

The comments, views, and information in this article are those shared and collected by the authors, CAPT Pothula and LT Harwood, and do not necessarily reflect those of the U.S. Navy or U.S. Department of Defense.

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