Damage-Control Medicine

IMMERSIVE TRAINING PREPARES MEDICAL PERSONNEL FOR FUTURE EN-ROUTE CARE, EVACUATION SCENARIOS

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In noisy, crowded spaces darkened by smoke from a shipboard explosion and fire, Navy corpsmen and medical officers rushed to treat severely wounded troops, stem fluid losses, determine the extent of damage and injuries, and quiet conscious patients writhing in pain.

“Don’t let me die,” a patient cried out.
“Who’s got ketamine?” yelled a corpsman working on a casualty.

Around them, at a recent training course in San Diego for a group of Independent Duty Corpsman School students, supervisors managed the care and worked to prepare for an air evacuation and coordinate transporting the wounded to higher-level surgical care via aircraft.

Outside, at a makeshift flight deck, waited an MV-22 Osprey tiltrotor ready to take on the half-dozen casualties the medical teams would carry out from the mock DDG ship's tight spaces and load inside the aircraft, its low-slung interior quickly crowded with just a few patients’ litters. Trauma care doesn’t end there, however. Medical personnel must work to keep patients stabilized — and alive — through any departure delays and long flights that can stretch an hour or more before they reach a place where lifesaving surgical care is done.

The casualty evacuation training didn’t take place aboard a ship, or at sea or in an Osprey with its tiltrotors cranking heat on a tarmac, but some 12 miles from the Naval Base San Diego waterfront, at Strategic Operations Inc. (STOPS).

The company’s training facility, formerly a movie studio, is geared to military, law enforcement and first-responders. STOPS’ “Hyper-Realistic” training scenarios and Hollywood effects, including moulage and “Cut Suit” surgical simulators it developed with injuries and wounds that bleed and ooze, adding realism to the training scenarios.

The STOPS courses are just a small segment of combat, trauma and en-route care training available to Marine Corps and Navy medical responders. But the MV-22 and makeshift ship simulators are helping support more hands-on, simulated trauma training with realistic platforms to build the skills needed by military and medical personnel to triage casualties, provide “prehospital” or en-route casualty care and potentially save more lives. Instructors say new students benefit from courses that include highly realistic and hands-on training environments, like an MV-22 that’s close to a real, full-up operational aircraft.

“They have to deal with chaos,” said Charlie Geiger, an instructor at Independent Duty Corpsman (IDC) School in San Diego watching a group of IDC students work on the wounded. “It ups their stress levels, so they know how to operate while they’re stressed.”

Training done at STOPS “is an amazing opportunity. It’s expensive, but you get what you pay for,” Cmdr. Benjamin Walrath, emergency medical services director for Navy Medicine West and an emergency medicine physician, told Seapower.

Walrath, a former surface warfare officer who also coordinates search and rescue in the region, sends residents to STOPS for training.

“We put them in the back of the V-22,” he said. “We’ve integrated their training with some of the special operations medics,” as well as search-and-rescue technicians and nurses. The training, he added, “gets rave reviews.”

The MV-22 Osprey at STOPS is on loan, under an agreement with Navy Medicine West to support the Shipboard Surgical Trauma Training (S2T2) initiative. The Osprey isn’t a fully functioning aircraft. It lacks the thick wings, engines and nacelles that give it lift. But the haze-grey airframe retains most of its interior. Its cables, hydraulic lines and fittings are realistic obstacles medical teams and air crews have to work around.
as they load, unload and work on patients on the deck and during transport to the next, higher-levels of medical treatment.

For students it’s the closest thing to having an operational Osprey to practice casualty and en-route care, and the only nonoperational MV-22 available for training.

The Marine Corps has no aircraft built or equipped as a dedicated casualty evacuation (CASEVAC) or medical evacuation (MEDEVAC) aircraft, however, unlike the Army, and since 2002 has sought to provide a credible en-route care capability. The service eyes the MV-22, with more than twice the speed of its fleet of assault helicopters, as the go-to platform for evacuating casualties and supporting surgical teams in en-route care up to 165 nautical miles to or from land or a sea base. That would enable intra-theater transport of patients to Level 2 care facilities at longer distances, with fewer refueling stops.

Still, even with an aircraft like the MV-22, getting to that Level 2 care “may take more than 20 minutes or 30 minutes. It may take an hour, two hours or three hours,” said Kit Lavell, a former naval fighter pilot and Vietnam veteran who is executive vice president at Strategic Operations. “And that means you’re going to have to do semi-Level 2 care aboard that aircraft.

“So it’s damage-control surgery. With damage-control surgery, you’re going to have to have all of the equipment, the procedures in place on the aircraft and with medical teams trained for such en-route care.

For the Navy and Marine Corps to provide that capability, “everything’s got to change. The mindset has got to change,” Lavell said, adding “we have a tendency to rely on what happened in the past and apply it to the future.”

The services continue to grapple with closing long-running gaps in en-route care capabilities, and those concerns are heightened with the prospects of what the next conflicts may look like. When casualties began mounting during the wars in Iraq and Afghanistan, trauma care focused much on the “golden hour” and “platinum 10 minutes” of medical response after an injury.

But senior leaders note that far-flung places like the Western Pacific or South China Sea may be too vast a distance for helicopters to fly, putting casualties at greater risk if those gaps can’t be closed by air or by sea. They predict the future fight on a larger, distributed battlespace will require prolonged casualty care extending across a potential “lily pad” of movements requiring the constant stabilization, monitoring and intervention of patients for what could be hours to reach surgical care. Fewer deployed ships and the potential that some countries could close airfields and ports, or prohibit overflight or land access, could further delay patient movement.

Continued doctrinal divides among the services add to the dilemma, Walrath said.

“Patient movement for the Navy is a major capability gap. The problem is in the doctrine. It is somewhat confusing,” he said.

“It’s going to be a huge problem, because no one technically owns patient movement,” he added. If war breaks out in the Pacific, with its vast distances, “you’re talking about losing a number of casualties.”

A senior medical officer implored researchers at a symposium this summer to get creative at finding ways to train first responders to provide operational forces with the medical care they’ll need in that next battlefield. Separately, Walrath said one idea he’s discussing with Marine operational forces could help en-route care and patient movement by establishing small deployable unit of providers.

Lavell believes more hands-on, realistic training goes a long way to help surgical teams, first-responders and others involved in prolonged, en-route casualty care get the skills they’ll need. The Osprey is helping research and development of tactics, techniques and procedures for damage-control surgery on an aircraft, he said, and it will be used during the S2T2 course starting in
February with the first Fleet Surgical Team (FST) of students under a contract with Navy Medicine West, he added. Up to eight classes a year are planned.

The FST is similar to the Role 2 Light Maneuver team the Navy first deployed in early 2018 to provide advanced trauma and life-support capability to underway or deployed forces. That grew from the Navy Adaptive Trauma Team proof-of-concept, tested last year during Exercise Dawn Blitz off San Diego, that sought to close gaps in surgical capabilities.

The Osprey “is just not a box” to train in but adds to the quality of the training, said Jethro Sofyan, a STOPS instructor and former Marine infantryman.

“The first time for anybody going through the training, they’ll get overwhelmed,” he said. “With the noise, it’s difficult to communicate ... so you’ve got to be louder and be more assertive. It’s like a good shock. I’d rather they make their mistakes here.”

The MV-22 fuselage is one of several training devices utilized during several courses, which includes Tactical Combat Casualty Care and Combat Trauma Management. There’s a bare H-60 airframe for hands-on medical and combat training. A nondescript warehouse building has a series of rooms akin to a house, berthing space or ship compartments. One section houses the DDG, designed as a ship’s interior spaces replete with brass fittings on walls, consoles, watertight hatches and passageways with knee-knockers, plus a trauma bay and mess area.

“They can practice stepping through hatches with litters and getting patients out of tight bunking,” said Jennifer Deveraux, simulations training manager with Naval Medical Center San Diego.

The property also houses a structure called “Ship in a Box.” Built to support IDC School training, its stacked metal containers are fashioned into a ship-like superstructure, with a pilothouse, control rooms, metal hatches, and ladders, and the shell of a Huey helicopter juts from a tower. It also supports force protection as well as visit, board, search and seizure training drills.

STOPS also has built “Ship in a Box” at the 32nd Street Naval Base in San Diego as well as naval bases in Chesapeake, Virginia, Mayport, Florida, and Ford Island, Hawaii.

For another group of IDC students, a small helicopter shell in the mock village served as the point of crash injuries. Casualties quickly mounted from an improvised explosive device and nearby snipers. Much like in the simulated ship explosion, students encountered a gritty, messy and confusing environment as they worked to treat, stabilize and prepare the casualties for the Osprey evacuation.

“Everything — from the terrain to the structures — is outside of the normal clinical setting of a sterile environment,” said Jaime de la Parra, a project manager at STOPS. “Now you’re having to make do with what you’ve got. ... Everything is makeshift. There is no actual bed. Where are you going to hang your IV bag from?”

Most critical throughout the process is collecting and assessing a patient’s vital signs and “keeping them alive,” Parra said.

In such “Care Under Fire” scenarios, students also must act quickly and get the wounded out of the line of fire and to a casualty collection point, perhaps a nearby house. There they start the initial “prolonged” care and evacuation. They practice making radio reports, call in the “9 Line” MEDEVAC request and coordinate with higher headquarters and work with the air crews, “so the flight crew will prep everything before they get to the destination,” Sofyan said.

Key is the stabilization of the patients throughout the transport, including any stops and transfers, so they must be properly equipped to deal with the patients’ needs, to include administering fluids, blood and medication. They’ll also have to prepare to provide care in the air, in unpressurized aircraft at altitudes that can affect patients, and first-responders, he said.

“Anybody can put an IV in a classroom,” said Sofyan, but the ability to put an IV in a patient in a dusty, darkened room or in a gyrating aircraft boosts a hospital corpsman’s confidence — and that of the Marines and Sailors counting on “Doc” to provide the best emergency care.

Students’ “confidence levels are a lot higher going through this,” he added.