Projecting Biomedical Security

By Craig Hooper

INCAT

Traditional hospital ships cannot project biomedical expertise onto a battlefield threatened by biological attack. Recent tests of focused-mission ships—such as this artist's rendering of an Incat catamaran serving in a medical support role—suggest that these prototypes might be ideal.

When confronted by a far-flung antiterror conflict or the prospect of biological attack, the traditional conception of the hospital ship as a supersized "white elephant" is terribly inadequate.[1] Navy medicine's alternative approach to biomedical support—making medical care an "organic" component of fleet combatants—is plagued by doubts that floating organic medical resources can provide high-quality casualty care on a complex expeditionary battlefield. In practice, orienting the carriers or multimission amphibians toward casualty care is an unwelcome distraction for these busy, front-line assets. This open niche can be filled by a handful of small, focused-mission ships capable of meeting the medical demands of a more dispersed and agile military.

New platforms, however, require a transformation in biomedical strategy. To make matters even more pressing, Navy medicine faces a procurement dilemma. Something must be chosen soon to replace or augment the currently commissioned *Mercy* (TAH-19)-class hospital ships which are more than 25 years old and approaching the end of their service life. Navy medicine also is on the verge of receiving a potentially influential homeland defense mission. Chief of Naval Operations (CNO), Admiral Vern Clark, in his 2003 CNO's Guidance, directed the Navy Surgeon General to "evolve medical capabilities as a 'Defensive Weapon System' to deliver enhanced medical surveillance, detection, and protection."[2]

Without some means to jolt it into testing innovative approaches to military medical care and devising an improved biomedical doctrine, Navy medicine will fail to meet the challenges posed both by CNO Clark and by the sprawling antiterror battlefield. One way to hasten the already overdue transformation of Navy medicine is to rapidly develop and deploy a few medical-oriented, focused-mission ships (FMSs). The prompt employment of basic FMS prototypes will enable Navy medicine to leave the quiet shoals of

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Countries with sophisticated weaponry, such as India and Pakistan, often will have disease-control infrastructure that is little better than this "cutting edge" rat-control team from the early 20th century. Epidemic disease becomes a strategic threat to global security in these cases.

peacetime and begin preparing for the infectious global battlefield of the 21st century.

A Specialty in Peril?

Before the antiterror conflict, Navy medicine lacked a compelling strategic rationale. With few casualties and the friendly confines of advanced, "higher echelon" European or Japanese hospitals a five-hour flight away from most potential conflicts, military medicine was, to some, an expendable candidate for outsourcing.

Over the past decade, the readiness of shipboard medical facilities atrophied as Navy leaders forgot the historical lessons about battlefield medical care and overlooked the demands good afloat medical care can make on deployed warfighting platforms.[3] Navy medicine also suffered a shortage of vocal advocates able to explain this poorly understood and technical field to the mainstream Navy. This led Defense Secretary Donald Rumsfeld in 2002 to state that he has "trouble believing that we should have, for example, in the Navy such a high percentage of our total force doing medical work."[4]

In some quarters of the blue-water Navy, however, the quality of Navy medicine is a growing concern. The attack on the USS *Cole* (DDG-67) in October 2000 increased the relevance of force protection and forward medical care. The now-constant threat of terror attack is forcing both the Navy and Navy medicine to confront the grim strategic reality of waging and medically supporting a global antiterror war.

Medical support requirements quickly expanded beyond providing care for conventional injury. The emergence of bioterrorism after the attacks of 11 September 2001 was a distant herald of future infectious battlefields. The biological threat remains unmet because military medicine lacks a broad biodefense mandate. While the global reach of terror groups and biologically armed rogue states becomes increasingly apparent, military medicine still hesitates to confront the bioterror threat on a strategic scale, eagerly yielding this defensive niche to a less-prepared, very turf conscious, and somewhat hostile civilian public health sector.

Why Biodefense?

The Navy needs a dedicated disease-fighting platform. In today's environment, where a rapid disease-control response is critical, hasty improvisation can only do so much. As the severe acute respiratory syndrome (SARS) epidemic demonstrates today, a tiny disease outbreak in a hotel, at a farm, inside a bioweapons laboratory, or even on an overseas battlefield can easily expand, become uncontrollable, and threaten the United States. Disease is a security threat.

Even as Secretary Rumsfeld adapted the Clausewitzian maxim that "war is the continuation of politics by other means," he downplayed the importance of biomedical assets that could defend against biological agents. For Clausewitz, disease was a matter for national defense. On 16 November 1831, reporting to the German frontier with orders to repulse a raging cholera epidemic, Clausewitz died after losing a day-long battle against the very disease he was sent to defeat.[5]

Biodefense must begin abroad. Overseas biological defenses—in countries most vulnerable and likely to suffer from infectious outbreaks—are ineffective civilian affairs that will endanger the United States. Certainly, as Secretary Rumsfeld wrote, "it is not possible to defend against every threat, in every place, at every conceivable time."[6] Some defensive power, however, even a simple biological surveillance tripwire, is better than nothing.

What the United States has forgotten, its rivals have learned. Islamic radicals use basic, reliable health care to cultivate public goodwill, delegitimize secular authorities, and gain basing or training rights. On an opposite extreme, the Russian armed forces increasingly understand the military and diplomatic value of rapidly deployable medical support. After short-sheeting medical care and suffering serious disease-related losses during the Afghanistan occupation, in 2001 the Russian Emergency Ministry moved a field hospital to Kabul almost before the city was fully pacified.[7]

Direct military benefit aside, it is in the United States' long-term strategic interest for the armed forces to be regularly engaged in operations that dispel anti-American views. A peaceful postwar Europe was made possible by a populace that long remembered the candy-bar bearing GI, and in today's global battlefield, similar firsthand contact with the kindly side of the U.S. military can confront terrorist attempts to exploit anti-Americanism.

Overseas, very basic, low-level health care is cost-effective and easy to mount, allowing the military to work alongside indigenous medical personnel and in host country biomedical facilities. The U.S. military can seize op-

portunities to build links with the biomedical community—possibly catching news of bioweapon development or suspicious disease outbreaks at an early stage. In the developing world, doctors and nurses comprise an important, highly influential segment of society that is worth cultivating.

BioShield at Sea

A low-profile, fast-moving battle to bolster floating medical infrastructure is under way. Until recently, the *San Antonio* (LPD-17)-class amphibious ship was touted as the natural choice to serve as a next-generation medical platform. In essence, the $800-million LPD-17 remains the only viable candidate to serve as a one-to-one replacement for the aging *Mercy* class. But the capabilities recently demonstrated by focused-mission ship test beds are giving the LPD-17 some competition. In particular, the *Joint Venture* (HSV-X1) has enlivened debates over the future disposition of floating medical assets, suggesting that the *Mercy* class can be supplemented rather than immediately replaced.

The hospital ships USS *Mercy* and *Comfort* (T-AH 20) are a cost-effective means to move a few complex and highly capable trauma facilities long distances. While still useful, these grand-scale hospital ships are unable to adequately project U.S. biomedical and biotech prowess. The United States needs numbers and versatility. A better model might be the venerable World War II-era LST or the old escort patrol craft (PCE[R]), a little studied but quite versatile 185-foot, 57-bed floating ambulance.[8]

New small-ship designs have the potential to serve as disease-fighting platforms and bolster America's forward medical presence. They can move quickly to a site threatened by disease and permit in-depth and vigorous action by disease-fighting "first-responders." Coupled with a well-appointed, possibly modular research lab/infectious-disease hospital and some modest amphibian, helicopter, and unmanned aerial vehicle capabilities, a rapidly arriving disease-control support craft can direct a pulse of aid and information to struggling local doctors and epidemiologists.

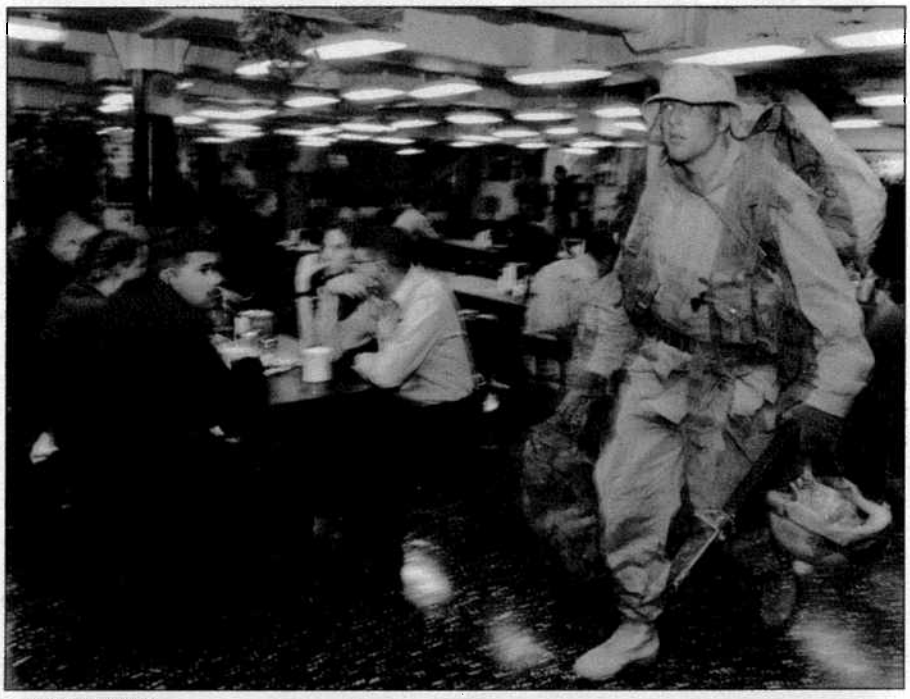
Successful epidemic control can depend on simple and relatively low-cost, high-benefit logistical interventions. In recognition of this, U.S. armed forces are modifying medical support doctrine. In one recent instance, U.S. forces quashed a whooping cough outbreak by quickly transporting a heat sensitive pertussis vaccine into the hard-to-reach Darwaz area of Afghanistan before the vaccine could degrade. The military made good on a promise to support a post-Taliban government.[9] Such aid is only a first step. As bioweapons enter more and more arsenals, U.S. and allied biomedical specialists will require extra logistical assistance when trying to control or investigate suspicious epidemic disease outbreaks.

A biodefense ship can securely coordinate logistics and communications for further deployment of disease-fighting personnel or elements of a larger security force. Even limited supplies, information, or logistical support—delivered in a timely fashion to key indigenous medical leaders or crucial facilities—can go a long way toward hardening local public health infrastructure and grant the United States a few precious weeks to prepare an effective biotech defense against hard-to-treat contagious diseases.

The Strategic Threat

Infectious disease response is a serious military matter. Once disease outbreaks become indistinguishable from acts of war, opportunities for miscalculation and even unwarranted nuclear retaliation emerge. The Indian subcontinent is a region where disease can affect sensitive diplomatic maneuvering. In February 2002, as India and Pakistan were engaged in the biggest military confrontation since 1970, Indian doctors discovered patients infected with the contagious bioweapon form of pneumonic plague in a region near the disputed state of Kashmir.

The plague outbreak posed a serious threat to regional stability—eight years before, a tiny plague outbreak in



U.S. NAVY (JOHNNY RIVERA)

Our large amphibious ships are vulnerable to infectious diseases brought on board from the battlefield, whether as a result of terrorism or simply mixing with the local community. Can we afford to have our logistical forward bases shut down and forced into quarantine in the middle of a war?

Surat, India, sparked a massive panic. India and Pakistan are vulnerable to both biological attack and natural infectious disease conflagrations. Yet neither country can readily distinguish between the two phenomena.

Luckily for the subcontinent, nature intervened in time to stop the nascent outbreak. A heavy snow snarled regional travel, keeping plague from spreading to crowded urban areas or deployed military units.[10] If asymptomatic victims had been able to travel and bring pneumonic plague to more populous regions, an India already in the grip of war fever would have been hard-pressed to do more than reflexively blame Pakistan and respond militarily. A nuclear war was but a few poorly placed coughs away.

During such a crisis, disease-fighting resources on a biomedical combatant can aid efforts to soothe panicked command elements and offer intelligence to countries that lack sophisticated medical infrastructures.

Biodefense as Hand-to-Hand Combat

Diseases are the ultimate Trojan horses, easily infecting deployed or ashore crewmembers, sneaking aboard and thriving in the crowded quarters of a ship. In 1999, a simple Norwalk-like virus was brought aboard the USS *Peleliu* (LHA-5) and spread by person-to-person contact, infecting at least 6% of the Marine contingent and crew over the course of 12 days.[11] In December 2002, two aircraft carriers critical for operations in the Persian Gulf reported contagious viral outbreaks. More than 10% of the USS *Theodore Roosevelt* (CVN-71) crew was stricken during a training cruise and the USS *Abraham Lincoln* (CVN-72), fresh out of Perth, endured an uptick in flu reporting. Influenza and Norwalk-like viruses are relatively harmless, gastrointestinal nuisances, but these contagious pathogens are too often dismissed. Downplaying "benign" disease outbreaks as just a routine and unavoidable hazard of Navy life fails to solve the vulnerability.

The biological battlefield might force the modification of the diplomatic strategy of port visits. On 15 March 2003, as the USS *Carl Vinson* (CVN-70) visited Pusan and SARS was spreading across Asia, the carrier put herself at risk by hosting a party for Korean dignitaries. Several assets, including the 7th Fleet command ship *Blue Ridge* (LCC-19), transited through Singapore after the city had been identified as a potential center of SARS transmission on 13 March 2003. Viral infections happen when ships are in contact with shore, so the Navy must proceed with caution and consider the geopolitical consequences if important blue-water assets were beset by SARS or some other more virulent pathogen.

Our biomedical intelligence lacks sophistication. Navy medicine can demand an opportunity to help bolster existing programs to quickly detect and act on disease threats. If disease-related biomedical intelligence reaches the Navy at an early stage, command elements or other diplomats can use a variety of means to overcome indigenous efforts to hide emerging epidemics. If appropriate intelligence resources are tapped, diseases such as SARS will have a hard time escaping into larger urban areas.

Logistical Hazards

On a conventional biological battlefield, small biomedical combatants can help smooth the interface between the large amphibious ships and their deployed land warriors. The threat of infectious biological weaponry is a special challenge to conventional amphibious warfare. As the Iraqi conflict demonstrates, adversaries consider America's logistical habits a big vulnerability. Logistical chains snake from the battlefield to large amphibians and even directly to the homeland.

Had Taliban and al Qaeda detainees held aboard the USS *Bataan* (LHD-5) and the *Peleliu* (LHA-5) acted as human biological bombs—or if any other visitor were unknowingly infected—these crucial ships likely would have been forced out of action and into quarantine. An injection of infectious disease into the sprawling logistical pipeline is likely to dismay coalition partners and lead to the abrupt closure of key bases and facilities.

For ships, the past serves as an apt prologue. In 1970, a patient incubating smallpox was able to spread the disease to three floors of a German infectious disease hospital before he became symptomatic—without leaving his room.[12] One unfortunate victim was infected after visiting the hospital for less than 15 minutes. SARS is proving to be a similar story. Air filters, germ detectors, anti-infective medicines, and other passive defenses can only do so much. A smaller, semisterile gateway ship can help screen visitors and insulate crucial large ships from potentially troublesome shore contaminants or incubating biological threats.

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[1]LCdr. Pietro Marghella, USN, "Replace the Great White Elephants . . . with LSTs," U.S. Naval Institute *Proceedings*, December 1998, pp. 71-73.

[2]"Achieving Sea Power 21," CNO's Guidance for 2003, <www.chinfo.navy.mil/navpalib/cno/clark-guidance2003.html>.

[3]Capt. Arthur Smith, USNR (Ret.), "Irrational Exuberance," *Navy Medicine*, January-February 2003, pp. 26-29.

[4]"Secretary Rumsfeld Speaks on '21st Century' Transformation of the U.S. Armed Forces (Remarks as Prepared for Delivery)," 31 January 2002, <www.defenselink.mil>.

[5]Michael Howard, *Clausewitz* (New York: Oxford University Press, 1983).

[6]Donald Rumsfeld, "Transforming the Military," *Foreign Affairs*, May/June 2002.

[7]"Russia's Afghan Aid Invasion," BBC News, 1 December 2001, <http://news.bbc.co.uk/2/hi/south_asia/168655.stm>.

[8]F. S. Bailey, "Risky Rescue," U.S. Naval Institute *Proceedings*, April 1951, pp. 359-63.

[9]"U.S. Helicopter Provides Vital Lift to Docs Treating Epidemic," DefenseLink News, <www.defenselink.mil/news/Oct2002/n10292002_200210291.html>.

[10]Ramesh Vinayak, "Germ of a Problem," *India Today*, 4 March 2002, pp. 36-37.

[11]Scott Thornton et al., "Detection of Norwalk-like Virus Infection Aboard Two U.S. Navy Ships," *Military Medicine*, October 2002, pp. 826-30.

[12]Henry Gelfand and Joseph Posch, "The Recent Outbreak of Smallpox in Meschede, West Germany," *American Journal of Epidemiology* 93 (1971), pp. 234-37.

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