Simulation technology shows Navy how to take a HIT

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The Navy soon will begin using an Office of Naval Research (ONR) technology to predict injuries and improve medical responses in any kind of attack on ships, officials announced today.

The Human Injury and Treatment (HIT) model provides a comprehensive capability to forecast casualties potentially encountered during combat operations aboard ships-a crucial piece of information that assessments of Navy vessels historically have lacked.

For every class of ship in its fleet, the U.S. Navy writes a "survivability report" that details a vessel's ability to withstand attacks. These assessments historically have focused more on hardware than personnel.

"When a weapon hits, we know how the ship itself will be affected by blast, fragmentation, fire and other damage mechanisms," said Dr. William "Kip" Krebs. "HIT allows us, for the first time, to accurately predict the impact to those Sailors or Marines aboard, both from a medical and crew-response perspective."

HIT places humans in sitting, standing and other positions throughout the 3D model of the vessel. It then calculates what injuries the crew on board could sustain based on smoke, pressure, fragmentation and other damage mechanisms resulting from an attack. The HIT model simulates patient movement and medical response, tracking outcomes for patients and their ability to return to duty within 72 hours after a simulated attack.

The HIT focus is on predicting injuries relevant to the threat environment and analyzing crew functional impairment in terms of specific jobs or roles aboard a ship. Krebs added: "The system also looks at incapacitation-could this person come back and perform his mission?"

HIT underscores Chief of Naval Operations Adm. Jonathan Greenert's call for innovation in his Sailing Directions to build Sailor confidence in their equipment and to sustain and modernize ships and aircraft through the use of new technologies.

Understanding the medical and operational impact of crew injuries opens up new possibilities in planning medical responses for such events. HIT provides cost-benefit analysis that takes into account a ship's medical capabilities and the ability of wounded crew members to return to duty.

This information can help the Navy design ship medical facilities more efficiently in order to improve response times. HIT will also help improve designs for Navy ships increasing operational effectiveness in the aftermath of an attack.

HIT model development wrapped up in late Fiscal Year 2014. ONR is currently working to transition the technology to Naval Surface Warfare Center Carderock Division for further development and testing.

Provided by Office of Naval Research