SBIR 06.2 PHASE I - AWARD DETAILS	
ORGANIZATION	MRMC
TOPIC NUMBER	A06-150
CONTRACT NUMBER	
YEAR OF AWARD	
AWARD START DATE	
AWARD COMPLETION DATE	
PROPOSAL NUMBER	A062-150-0842
TITLE	Inspiratory Impedance as a Treatment for Traumatic Brain Injury
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KEYWORDS	traumatic brain injury, intracranial pressure, inspiratory impedance device, circulation, hypotension
ABSTRACT	Traumatic head and neck injuries account for 16-33% of all war-related injuries and are a leading cause of mortality upon evacuation to a definitive care setting. This application is focused on treating one of the most important determinants of outcome from severe head injury, the degree and duration of elevated intracranial pressure (ICP). The main objective of this proposal is to continue the development of the inspiratory impedance threshold device (ITD); an operationally useful and effective device initially designed to counteract the effects of severe hypotension after the development of hemorrhagic shock, heat shock, and dehydration. New research has discovered that the ITD has a marked effect on reducing ICP. When ICPs are decreased in spontaneously breathing patients during inspiration through an ITD or when using a modified ITD called an intrathoracic pressure regulator (ITPR) in non-breathing patients, the small vacuum created in the thorax enhances venous return to the heart thereby enhancing cardiac output and decreasing ICP. The successful development and deployment of a new device designed to immediately decrease elevated ICP or prevent the onset of elevated ICP following traumatic brain injury is an important advance in treating battlefield casualties, a major cause of death for American soldiers.
BENEFITS	The economic burden of traumatic brain injury in the civilian population alone is immense. In 1985, the lifetime medical care costs for traumatic brain injury in the United States was estimated at 4.5 billion dollars, with per-patient hospital costs (acute care only) in the tens of thousands of dollars. Traumatic brain injury affects 3 out of every 1000 Americans each year accounting for as many as 60,000 deaths and an estimated 70,000 to 90,000 patients with permanent neurologic disabilities. The main objective of this Phase 1 proposal is to

	elucidate the mechanism by which the ITD decreases intracranical pressure and to determine the optimal resistance for treating head injury. As such, this new device has the potential to be an important advance in treating head trauma casualties, a leading cause of civilian and military mortality.