



## **FAST Combat and FAST Responder**

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## ***Introduction***

Abattle-tested, life-saving medical device is entering its final stages of development and is ready to be added to the existing arsenal of cutting edge medical technologies available to Warfighters, hospital clinicians and emergency medical service providers. The FASTCombat™ is the latest and most advanced Interosseous (IO) device anticipated for clearance by regulatory agencies and released by Pyng Medical ([www.pyng.com](http://www.pyng.com)) into the marketplace in Spring, 2013. “The device removes all guess work to establishing access for fluid resuscitation, administering required medications, and replaces the older FAST1® that has been in use by military medics and physicians since the early 2000’s,” said Pyng’s Chief Executive Officer, Mark Hodge. Retired Army Colonel and Special Forces physician, Al Moloff, MD, said, “The FASTCombat™ is an easy to use, rapid and effective device for initiating vascular access under the most demanding conditions on the battlefield.” Dr. Moloff continued, “The new FASTCombat™ is about one-third lighter, and smaller, than the FAST1®, and will come in a smaller more compact container. It will require about one-half of the pressure needed to deploy the FAST1®, to rapidly, safely and effectively insert the needle into the bone marrow of the sternum. Virtually any medication, drug or fluid, including whole blood, can be given via IO. The rate of flow is comparable to peripheral IV’s (intravenous) and can be used with gravity flow, manual pressure, or a pressure infuser.”

## ***How it began***

Interosseous technology emerged onto the medical scene circa 1922 (Drinker CK, et al: The circulation in the mammalian bone marrow. American Journal of Physiology, 1922), as a means of fluid replacement in pediatric patients. Low blood volume, and low blood pressure resulting from trauma make access to patients’ veins in some cases difficult if not impossible. However, infusion of life-saving fluids through the marrow of the bone showed remarkable results. The procedure was adopted for battlefield use in WWII, as well as Korea and Vietnam. Little was done to advance the technology until Pyng Medical introduced the FAST1®, the first hand-held mechanical device, which was approved for military use in the early 2000’s. Since then, Pyng’s FAST1® has become the favorite and mainstay of interosseous infusion on the battlefield, as well as in hospital and pre-hospital environments.

## ***How it works***

“Think of bone marrow as a non-collapsible vein,” says Dr. Moloff. “The sternal bone marrow is a readily accessible and physiologically active tissue that allows any fluid or medication to be rapidly moved to the heart and blood circulation.” Original IO technology involved manually boring a hole through the outer layer of hard bone to reach the softer and more porous marrow. In 1932 this meant accessing the marrow of the cranium; in later years large bore stainless steel catheters were used to access marrow in the long bones of the legs, e.g., the tibia, or femur. The specific target of the FASTCombat™ is the manubrium portion of the sternum. The FASTCombat™ is a stand-alone device that automatically releases the needle accessing the marrow. The user simply places the device on the casualty using easily and readily identifiable anatomical landmarks, and pushes the device toward the chest – the FASTCombat™ does the rest. It determines the correct depth, pierces the outer cortical bone, and seats the catheter firmly into the marrow. The medical provider completes the task by connecting the fluids to the FASTCombat™ system and monitors the rate of the fluids absorbed by the marrow. It is an amazing invention.

## ***Does it work?***

“Absolutely,” said Dr. David Morehouse of 2SRG, an independent researcher who conducted testing on the new devices throughout 2010, 2011 and 2012. “I was deeply impressed by the company’s desire to be the best in every measurable area with these devices. They have improved their device with each generation, improving ergonomics, reliability, and tactical packaging. When considering what color to make the FASTCombat™, they did not simply decide on the color black. Instead, they set about testing various materials, textures, and colors, under low light, no light, using night vision goggles, infrared, and thermal imagery, to determine which combinations provided the highest visibility to the user. Handle ergonomics and textures were tested in blood and other body fluids to ensure maximum grip, in order to facilitate accurate placement by the user. They left nothing to assumption. Even the tactical packaging selection took on a life of its own, with Pyng engineers taking into consideration every imaginable scenario a medic might encounter while on mission. They wanted to ensure the device was protected without adding weight and cube and that opening the packaging would be

a simple process during difficult mission conditions. It was the most impressive and comprehensive development testing I've seen. Training materials and training systems is another area where Pyng chose not to be rivaled, Dr. Morehouse continued. "Users of the new FASTCombat™ will have available one of the most advanced training systems possible." Pyng's CEO, Mark Hodge stated, "We know that training is everything when it comes to saving life on the battlefield. We have carefully outlined appropriate training protocols and merged them into a comprehensive training program designed to maximize success with this new device.

Dr. Moloff stated, "Fundamental initial training as well as realistic scenario based sustainment and pre-deployment training is critical to mission accomplishment and saving lives on the battlefield. Pyng has carefully considered the correct training protocols and merged them with state of the art training aids.

### ***How to get it***

Tens of thousands of FAST1® IO devices are already in the inventory for NATO Coalition and U.S. Forces. Units can purchase the existing device via National Stock Number (6515-01-536-9363), or, check the Pyng Medical website at [www.pyng.com](http://www.pyng.com) for information about how to buy the current device, and place orders for the new FASTCombat™ when they are available for sale. "We expect to provide the superior IO solution that best meets the specific needs of the combat medics and corpsmen, or the emergency medicine provider (EMS) at a price comparable to devices offered today," said Nadine Sidqueland, Pyng's Vice-President for Global Sales and Marketing. The new FASTCombat™ will have a civilian hospital pre-hospital partner in Pyng's new FASTResponder™. It is an identical device in every way with the exception of the packaging and the color scheme. In the FASTResponder™ these design attributes are tailored to the needs of the civilian medical community. Ergonomically and functionally, the FASTCombat™ and FASTResponder™ devices are identical; however, they are marked and packaged to accommodate slightly different procurement, inventory, and storage considerations.

### ***How it will affect battlefield care***

On the battlefield, the new FASTCombat™ device will allow combat medics and corpsmen to safely, effectively, and rapidly administer fluids and medications under adverse field conditions. The design of this new device not only makes it more compact, but easy to learn, and use. Certainty is a key design characteristic in both the new FASTCombat™ and the FASTResponder™. Both devices are smaller and lighter than the FAST1®. There are fewer steps needed to use the devices so it is easier to train someone to use them with greater learning retention. To be offered separately, the new training system is a complete, durable, cost effective training tool, designed to enhance any medical training program. The FASTCombat™ and the FASTResponder™ have their intended populations; however, both can be used on the battlefield, in civilian and military pre-hospital care, the emergency department, and as a "code cart" adjunct.



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