Charlie's Horse® Deployment System
Medical Emergency Response Facility (MERF) ®
MERF Protocol©

This document will introduce you to the innovative Charlie's Horse Deployment System and the Medical Emergency Response Facility (MERF). These systems deliver crucial critical care capabilities to areas where they're needed, deploys those resources in any location and does so by design using a minimal workforce.

The Charlie's Horse Deployment System, in combination with the MERF concept, corrects outdated or inadequate equipment and response doctrines used in the past and truly meets the out-of-hospital needs of today's military and disaster response personnel when a field critical care capability is required.

The Charlie's Horse Deployment System is a field medical Lego System comprised of interchangeable component parts enabling the end-user to create ten different models of multi-functional equipment. By designing a system of interchangeable parts, logistical support is greatly reduced along with training and maintenance of equipment.

The MERF is a multi-functional, advanced, capability system--- a much refined version of the famous M*A*S*H* system deployed during the Korean War. Each MERF is designed as a rapid-movement, rapid-set-up, 10 bed facility that comes complete with all the equipment needed to staff an Operating Room, Intensive Care Ward, Triage/Treatment/Holding Facility. This system is modular and scaleable to the incident it is responding to; 20-30-40 bed capabilities set-up as quickly as a 10 bed module sets up.

The MERF's new approach (protocol) to equipment and personnel deployment involves the use of specially designed cargo canisters and multi-functional equipment that can be easily moved by one person and utilized in multiple ways once unloaded at an incident. This system allows end-users to bring state-of-the-art medical, trauma and critical-care capabilities to any size incident within hours of the event. What's more, they can have all necessary equipment set up and operational within one hour with a staff of ten---five men and five women.

Genesis of the Charlie's Horse Deployment System & the MERF

The idea behind both the Charlie's Horse Deployment System and the MERF was born out of several years of careful research and interviews conducted with members of emergency response organizations, the disaster response community and the Armed Forces Medical Commands. The interviews determined whether existing protocols for prolonged incidents provided the necessary response and capabilities needed to fulfill mission requirements. The groups were also asked whether existing equipment stockpiles sufficiently supported the personnel expected to implement the response protocols.

What was discovered during the interview process was that there was a gap between those responsible for implementing response and treatment protocols and those who conceived the protocols. It was also apparent that existing equipment was inadequate and required significant manpower to deploy and make operational.

Redundancies also existed in both the military and civilian sectors. Instead of developing systems and protocols that were synergistic, with commonality of equipment, bureaucracies prevailed and funds were squandered. It became apparent that a new approach was needed when it came to a field medical deployment and the utilization of manpower.

When Hurricane Katrina struck New Orleans and forced thousands of residents to seek shelter in the Superdome, vital resources, such as water purification, power generation and oxygen concentration weren't available for days until Disaster Medical Assistance Teams (DMAT) and other federal assets arrived. Even than, these desperately needed pieces of equipment did not arrive: They were not in the inventory of equipment which was deployed.

Considering the size and scope of today's major incidents, be they natural or manmade, this is an "old school" approach to disaster response. Federal agencies, states and disaster response teams must be better prepared to address incident needs early on.

When the Northridge earthquakes struck Southern California in January 1994, they disrupted hospital and emergency department operations, forcing staff to work in parking lots under the hot sun until DMAT Teams and military resources arrived or other shelter facilities were located. This same scenario is again being played out in Haiti 15 years later.

A University of Delaware Research Center report on issues involving inter-governmental coordination during the Northridge earthquakes highlights the need for improvements in the way we respond to and manage large disasters.

This report highlighted the need for a flexible but coordinated disaster response protocol. All field medical operations have a great deal in common, whether they're military combat operations or disaster response operations. The size and scope of patient needs are the same in the first few hours after a major incident as they are after a military battle. It has been demonstrated that a more significant clinical impact can be realized and more lives saved, if triage, surgery and critical care are offered soon after the incident or battle (Expanding the Golden Hour). Where field medical operations differ is in the types of injuries and illnesses that are treated in each.

The central issues surrounding all field medical deployment operations that came to light during the interview process included;

- ***Concern about the weight and space required to deploy the equipment and resources.***

- ***The need for easy deployment of all equipment and shelters***

- ***The reliability of the equipment deployed.***

- ***The need for less dependency on logistical support, particularly because resources required to off-load and move heavy equipment are not always readily available.***

- ***The need to use available manpower in a more efficient manner.***

- ***The need to standardize equipment between civilian emergency disaster response organizations and corresponding branches of the military.***

These central issues presented an interesting paradox. How do you increase the productivity and capabilities of a field medical deployment while reducing the overall footprint of that capability?

The solution: Design an integrated deployment system made up of interchangeable parts that can be configured into different pieces of equipment as mission requirements change. This equipment must be reliable, multi-functional and have a force multiplying capability.

Further review of the research and interviews also revealed the need for an improved protocol for field medical deployments, one that could be implemented in all scenarios with the resources available at the time. This protocol would also have to address why existing major incident protocols were failing.

Why Existing Protocols Have Failed

Existing protocols for the deployment of a field medical capability are inadequate. It's assumed that the individuals responsible for implementing these protocols will function at the same levels they function at during training. Such personnel usually train after getting eight hours of sleep and a good breakfast, so their performance level is at its highest.

However, during a disaster, it's not uncommon for deployed personnel to arrive on scene after having little or no sleep for 24 hours. They may also experience a high level of stress if worried about the welfare of loved ones left behind. The performance of these individuals is therefore compromised, and the situation going forward will deteriorate since sleep deprivation and stress only compound as the length of the deployment increases. To add to the stress level on scene, assumptions made about the resources that will be available to assist in the scene set-up are often inaccurate, as are assumptions

about the condition of the region's infrastructure where the major incident has taken place.

During disasters, such as earthquakes, hurricanes, tornadoes and terrorist events, the existing health-care infrastructure is either overwhelmed or destroyed, and the need for outside help is immediate. Within 72 hours following a disaster, local health-care resources begin to recover and become operational if they have not been destroyed.

Traditionally, it has taken 72, 96 or 120 plus hours for a critical care capability to arrive and become capable of patient care. Disaster management officials must therefore improve their response capabilities not only for earthquakes and hurricanes, but also terrorist attacks, pandemic influenza, loss of a hospital due to an incident and large public gatherings, such as a Presidential Inauguration, political conventions and the Olympics.

The traditional health-care response that provides large, multi-bed resources to major disasters from outside agencies and major stockpiles, which are essential after an incident, is often described as slow and cumbersome. This description does not reflect in any way on the health-care professionals involved, but on the nature of the protocol and equipment with which they respond. Deployments with large shelter facilities that take days to deploy and many hours to erect impede the process and delay the care and services desperately needed within hours after a major incident. Equipment that takes several hours to set up also delays the readiness of the deployed facility. To add insult to injury, teams arriving to set up operations are often left to fend for themselves; the Haitian earthquake is a perfect example of this.

Two factors that greatly affect the amount of time needed to set up deployments are the weight and bulk of much of the traditionally deployed equipment, which requires significant physical effort to move and position. This results in personnel becoming physically exhausted, stressed and diverted from delivering medical care to those in need. Their exhaustion is compounded by the very nature of the events they're deployed to, putting them under added undue stress.

The usual response teams, such as DMAT, can provide assessment, triage, minor surgery and the equivalent of sick-call care, but they don't have the equipment or capability to perform major surgery or intensive care patient management.

Traditional response teams are able to provide potable water and electricity, but they're limited in there ability to supply purified water, medical-grade oxygen, radiology and diagnostic capabilities. The Charlie's Horse Deployment and the MERF addresses these problems.

Taking Deployment to the Next Level

The inventor and author of both the Charlie's Horse Deployment System and the MERF Protocol began designing these systems in 1996, long before the terrorist attacks of September 11. While serving as a consultant to Marine Corps Systems Command on the development of their Forward Resuscitative Surgical System (FRSS), the inventor believed a rapidly deployable, high-quality field medical care capability should be readily available to respond to major incidents where ever they may occur.

The ideal deployable field medical response should be able to:

- ***Be operationally independent for at least 72hours or more***
- ***Deploy by any available means***
- ***Deploy worldwide within 24 hours***
- ***Become fully operational within one hour of arrival on scene***
- ***Depend entirely on the manpower on scene to become operational***
- ***Require no heavy lift capability to deploy or become operational***
- ***Be scalable to the incident***
- ***Deliver optimal patient management from triage through staged resuscitative surgical interventions***

- ***Deploy and become operational so easily that monthly or quarterly training doesn't become overly burdensome for involved agencies and their personnel***

The Medical Emergency Response Facility (MERF) Protocol©

Having solved the equipment-deployment and force multiplication aspects of the paradox, the inventor authored the MERF Protocol. This protocol is a highly functional disaster management and major incident response concept designed to maximize results with the resources available at the time they're needed, with reasonable expectations of success.

Large deployed health-care facilities (HCF), although effective once they become operational, routinely don't arrive on scene within the first critical 72 hours after an incident. In addition, in worst-case scenario, should a chemical, biological or nuclear event (CBRNE) occur that contaminates this HCF, 100% of the deployed health-care support offered by the facility will be rendered useless.

Add to this the logistics involved in gathering hundreds of non-ambulatory casualties strewn over miles of devastation where the infrastructure has been decimated and you have another disaster. It is illogical to assume that the resources necessary to achieve such a task would arrive on scene in a timely manner. Furthermore, every man and woman deployed requires logistical support; food, water and sanitation. This burden is on top of the logistical support required to deploy a large traditional health-care facility.

In contrast to the large, single HCF used by many federal and state agencies, the use of multiple, locally housed, rapidly deployable, scalable, highly mobile MERFs offers many advantages and back-up capabilities. This is the primary focus of the MERF Protocol.

The MERF Protocol for deployment involves multiple, highly mobile MERF systems. The deployment of multiple MERFs, distributed strategically throughout an affected community (s), enables the immediate disbursement of medical care from triage through staged resuscitative surgical interventions.

Each of these 10-bed facilities becomes operational in less than one hour of arrival on scene in any room of opportunity or within its own shelter system. These facilities offer medical assessments, BLS/ALS treatment, surgery, intensive care, radiology and other diagnostic capabilities on scene. This means that MERFs will arrive earlier---well within the 72 hour window---than federal DMAT Teams, hospital ships and other large medical resources. What makes this possible; MERFs require no logistical support whatsoever for the first 72 hours of their deployment.

Each of the MERFs is independent, but linked via common communication frequencies or WAN/LAN. Some MERFs can be customized or physically connected together if scene needs dictate. In addition, regions that have existing shelters and mass-care equipment can add components of the MERF, as well as Charlie's Horse equipment, to their existing system, thus further expanding their capabilities.

The versatility of the MERF along with the Charlie's Horse equipment within, allows parts of the facility normally deployed for one application be converted to another on scene as mission requirements change. For example, triage can be transformed into ICU and ICU can be transformed into OR as the needs develop. The Charlie's Horse Deployment System is designed to be adaptable and compatible with the other specialty-area equipment and equipment used by the military. For example, all Charlie's Horse equipment is compatible with NATO spec litters/stretchers.

In contrast to the earlier example of a CBRNE incursion occurring at an incident due to a secondary explosion and wiping out a single, large-footprint, medical facility. Because of the small footprint of each MERF and the purposeful distribution of the MERFs, a CBRNE event in the area of a MERF facility will only result in the loss of a single MERF, leaving all remaining operating at full capacity.

As the situation stabilizes and other large facilities are erected and brought online, if the deployed MERFs are still required, they can consolidate into the large bed-count facilities as the critical care portion of that facility. In addition, if long-term care is needed at the scene of a disaster, or should indigenous health-care facilities be rendered inoperable as occurred in both the Katrina and Haitian disasters, the MERFs can be consolidated into a larger (100) bed plus facility and remain on scene.

For additional information regarding these systems and their capabilities:

Charles W. Darling III
President/CEO

North Coast Outfitters Ltd
1029 East Main Street
Riverhead, New York 11901
Tel: 631-727-5580
Fax: 631-727-5584
E-Mail: charlie@charlieshorse.com
Website: www.charlieshorse.com

Charlie's Horse® Deployment System
Medical Emergency Response Facility (MERF) ®
MERF Protocol ©