

Short Commentary

Rainbow for Africa Field Hospital

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Abstract

In 2013, the World Health Organization defined the standards for the medical teams involved in the setting of a sudden onset disaster. Rainbow for Africa is an Italian nongovernmental organization operating in a network of organizations with the aim of providing medical care in disaster response and through humanitarian assistance. It has been recently involved in the European migrants crisis in Greece and in the Mediterranean Sea, with the deployment of medical containers for the stabilization of critical patients. Moreover, Rainbow for Africa has developed a mobile and self-sufficient field hospital, incorporating a logistic structure, a two-beds intensive care unit, a surgical operating theatre, and a pneumatic tent for the inpatient care.

Keywords: Disaster Medicine; Emergency Medical Team; Foreign Field Hospital; Foreign Medical Team; Rainbow for Africa; Sudden Onset Disaster.

Manuscript

In the last decade it has increased the necessity to guarantee emergency care in remote areas, especially in developing countries, in response to natural catastrophes or Sudden Onset Disasters (SODs)[1-3]. Disasters have been defined as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources[4].

Following the experience on the field during the earthquake in Haiti in 2010[5], numerous efforts have been made to describe the standards in order to ensure the quality of services provided by Emergency Medical Teams (EMTs), in accordance with the new definition discussed during the EMT Panama Global Conference in 2015[6], in responses to SODs. Since any mobile, self-contained, and self-sufficient health care facility may be considered a field hospital[7], a system was required to help in defining the aim of the different teams.

In 2013, the Department of Emergency Risk Management and Humanitarian Response of World Health Organization provided this first classification system for EMTs involved in trauma and surgical care in the first month following a SOD[8].

The EMTs have been classified by three types depending on the level of care, size, capacity, and capabilities to deliver pre-defined services. EMT type 1 provides only triage and first assessment for at least 100 outpatients daily. EMT type 2 is involved in acute general and obstetric surgery, ensuring advanced life support and damage control surgery for trauma. EMT type 3 is more complex and must guarantee inpatient referral surgical care and intensive care facilities[8].

More recently, a specific working group has been developed to coordinate and formalize the contribution of the EMTs. Following their recommendations, an additional category was added to these categories to include specialist cells and support teams.

Rainbow for Africa - R4A - Medical Development (R4A), is a Non-Governmental Organization (NGO) that operates in international development and cooperation. R4A was founded in Torino, Italy, in 2007 and it has been recognized as registered NGO since 2009. It consists of doctors, nurses, other health professionals, engineers and information technology specialists. The organization has been working for many years in Senegal, providing training and supporting to local health services with interventions on prevention, treatment of environmental infections and emergency medicine[9]. In Sierra Leone, R4A has been present with projects focused on ultrasound and traumatology training[10]. Rainbow Crisis Unit (RCU) is a specific branch of the organization dedicated to emergency response to health crisis, and it consists in logisticians, technicians, anesthesiologists, surgeons, emergency

physicians, and nurses. It took action in Haiti during the earthquake in 2011, and in Sierra Leone during the Ebola outbreak in 2015. Since 2016, RCU is involved in the migrants rescue, at first on the Greek islands of Lesvos and Chios, and currently in the Mediterranean Sea on the rescue ship “Iuventa”.

In order to improve the response to SODs, since 2016, R4A has been started to build up its own field hospital. It consists in three shelters, named “Hope”, “Peace”, and “Future” and one pneumatic tent.

“Hope” has a supporting structure made of steel, with outer covering of aluminum and PVC inner liner. The walls and the ceiling are fire resistant. This shelter is the smallest of the three modules (Size: 4.20 mt x 2.15 mt x 2.30 mt; Weight: 2,500 kg), and could be loaded on a 4WD-truck, which can take narrow trails or steep slopes to reach the most remote locations. The basic equipment consists of a low-energy refrigerator, a washbasin, a 150-liter water tank and a pump for the hydraulic system pressure. Inside there is a cupboard with 18 large drawers for tools and accessories, a low-power LED lighting system, and an air conditioner. In the technical and logistical equipment, there are also the facilities for satellite and radio communications, and there's a GPS tracker. Interior space is divided into three distinct parts: a workshop, an office and a small warehouse. The module is arranged to be connected to the urban electric network in normal operations administration. Otherwise, it is provided with photovoltaic system capable of making it completely autonomous. Specifically, it is equipped with 4 photovoltaic panels (300 watt each), a charge controller to stabilize the input voltage, 4 AGM batteries and a 2 kw inverter are placed.

“Peace” is a sturdy shelter equipped with 4 corner jacks for self-unloading from the truck and for the eventual leveling on rough terrain. It is more spacious than “Hope” (Size 6.0 mt x 2.45 mt x 2.40 mt; Weight: 7,000 kg), and acts as Intensive Care Unit (ICU) or emergency room. On the roof 12 solar panels are placed, supporting a 4 Kw electrical system with 5 AGM batteries. Inside there are two solid hydraulic beds fully articulable. The interior is not divided and gives way to an open space, with fully equipped ICU, including multi-parameter monitors, defibrillator, oxygen, mechanical ventilator, ultrasound, point-of-care blood tests and gas analysis, infusion pumps, and a radiant newborn cradle.

Finally, the last module is “Future”. The shelter has the same external features of “Peace”, with a slightly different arrangement of the interior space. The shelter is provided with drawers in solid aluminum on three sides and it works as general and obstetric surgical operating theatre. This module can be loaded or unloaded on a truck through self-leveling hydraulic legs.

The facilities include autoclave, surgical lamp, articulable operating table, mechanical ventilator, and multi-parametric moni-

tors. “Future” does not currently have solar panels, but can receive energy from “Hope” and “Peace”. Nevertheless, it is provided with the generator that allows energetic autonomy.

To complete the field hospital, there is also a pneumatic tent with six beds for the inpatient care, that can receive energy supply from the shelters. All the field hospital is airconditioned with high efficiency heat pumps.

In October 2016, the field hospital was officially presented and inaugurated in Castelgomberto, Italy. The mobile clinics are currently stored in a warehouse, and would be quickly available to be deployed in case of future disasters.

Over the recent years, the European region has been witness of an increasing number of humanitarian crises. Whether outside its borders, facing the largest Ebola outbreak in the history, or along the thresholds of Europe, with the ongoing Mediterranean migrants crisis, numerous organizations have found themselves engaged with the emergency response. RCU decided to invest in the construction of an energy-independent field hospital, that can be rapidly transported with low-cost consumption and sustain difficult weather conditions.

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