LifeBot Mobile Healthcare: Advanced Telemedicine with continuity of care

LifeBot is a Medical Device Company Specializing in Emergency Service

Lifebot's Mission is to redefine healthcare delivery by providing the most advanced Telehealth communication, monitoring, and software solutions available to facilitate the seamless transfer of information for efficient, high-quality clinical care, administrative and educational services.

LifeBot Product Overview

Lifebot portable telemedicine products provide high quality audiovisual, physiologic monitoring, advanced diagnostic tools, data aggregation and an electronic patient care record used to assess, triage, and diagnose patients remotely. The LifeBot 5 and 6 is a unique portable telemedicine device used for medical emergency services that can collect all vital signs and communicate them to a hospital, clinic, physician or medical specialist bringing advanced medical services to patients in urban areas, remote areas or battlefields.

The objective is to provide fast diagnostics and take fast decisions with regards to patient orientation. The computer revolution has for almost a decade been central to a nursing revolution known as telephone triage. The registered nurse can be virtually out in any community to help patients and their caregivers make informed decisions on appropriate emergent intervention and the venue commensurate with the determined level of necessity."

Lifebot is a unique system that integrates medical devices in the ambulance to create an electronic patient care record that can be exported as a pdf file. The wireless technology is the only commercially available portable telemedicine product that uses 4G, 3G, LTE, WiMax, cellular, Wi-Fi, satellite, and military data radio connections automatically, aggregating all available bandwidth, in order to provide efficacy in very low-bandwidth situations and includes audiovisual communications with the provider. The system has been tested using ultra low bandwidth as low as 30k and network latency as high as 1500ms.

Lifebot is distinct in that it is able to store data internally if a connection is lost and transmit when the connection is re-established. It uses an ID scanner that is able to scan a patient's driver's license to obtain demographic data and is secure using advanced encryption standard in order to meet HIPPA standards through cloud-based VPN. Lifebot can connect with up to four additional external cameras that the physician can control from the clinical work station remotely allowing the provider multiple views of the patient.

Figure 1: the physician remotely connects with the patient, collect rich data and make fast informed decision

Founding history

It is the most advanced systems for EMS Telemedicine in the U.S. and was initially developed for the U.S. Military and are now available for use commercially. LifeBot® is based on DREAMS™ system. DREAMS™ stands for "Disaster Relief and Emergency Medical Services". This system is the most tested and proven in six years of actual use, even during the hurricanes Katrina and Rita disasters. Research on this, one-of-a kind system, was funded by U.S. Army Medical Research and Material Command (USARMMC) and the Telemedicine and Technology Research Center (TATRC) via a $32M grant.
The system was the brain child of famed Texas trauma surgeon Dr. James "Red" Duke, Jr who passed away in 2016.

Figure 2: famed trauma surgeon Dr."Red" Duke triaging Hurricane Katrina victims in New Orleans 600km away

LifeBot use case

Telemedicine can assist patients who need urgent or acute care. Providers leveraging advanced telemedicine technology can connect virtually with patients to replicate the collaborative decision making care environment of a hospital. We have provided sample use cases that highlight how EMS can utilize telemedicine in different settings to improve patient outcomes.

Figure 3 : General Dynamics uses LifeBot for its Light Armored Vehicle Ambulance

Using telemedicine in remote settings

On a scenic road in Pickens County Alabama, Mary Williams is driving. When a deer suddenly crosses the road, she tries to avoid it and leaves the road to crash a few dozen meters lower.
She has evidence of a closed head injury. She is having trouble breathing because she has air in her subcutaneous tissues. She probably has a collapsed lung caused by fractured ribs puncturing her right lung. Her low blood pressure and rapid heart rate suggest that she has injury to solid organs
in her abdomen. Her broken femur is also another source of blood loss. Because the accident occurred on a popular road, first responders reach her quickly, carry her to a waiting ambulance and look after her as the ambulance heads for help.
The nearest town is a small town with no hospital.
The nearest Level I trauma hospital is more than 1 hour away. She's already almost beyond the help she needs.

Figure 3: A screen from the emergency run record display at the paramedic mobile workstation in the ambulance

Fortunately, the ambulance is equipped with a Lifebot allowing the physician real time physiologic data and audiovisual to assist the EMS in diagnosis and treatment.

The first responders use the cellular -linked electronics to connect to trauma specialists with real-time data on the young patient's heart rate, blood pressure and respiration. Through high-quality video, doctors in the distant emergency room see Mary and direct the first responders' treatment of the patient. The EMS team can assess the patient using a digital ultrasound and stethoscope that is transmitted via the Lifebot to the physician for remote diagnosis. The Emergency Room physician was able to consult with a Neurosurgeon, Trauma Surgeon and activate the OR Team prior to the patient's arrival. When she arrives in the emergency room, Mary can be treated right away saving significant diagnostic time.

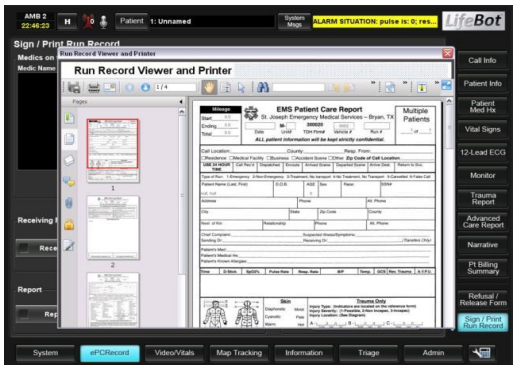

Figure 4: Printable e-PCR

Utilizing Telemedicine for multiple trauma victims in Remote Settings

A group of students are hiking in remote mountains. While crossing a wooden bridge the supporting cables snap. Three students fall approximately 5-6 meters . Two of the students complain of back and leg pain and the third of abdominal pain. EMS is activated and the first responder arrives within 8 minutes. Vital signs are checked on all three students and are stable. The EMS Tele-Emergency Physician in the closest large city is activated within 60 seconds status post vital signs and initial assessment. The third student connected to a LifeBot 6 monitor and assessed virtually including an abdominal exam. The integrated Lifebot 6 portable ultrasound reveals large left peripheric hematoma and a splenic laceration with free abdominal bleeding. The Tele-Emergency physician notifies the local trauma facility and trauma surgeon on call. An IV is started and IV fluids and oxygen therapy is started. The third patient triaged and emergently med-evacuated to local trauma facility. The rapid triage, transportation, and activation of the surgery team allowed the patient to bypass the emergency room to go straight to the operating room. This saved valuable diagnostic time and allowed for more rapid treatment of the patient. The patient undergoes splenectomy and has complete recovery form injury.

Utilizing Telemedicine in difficult to reach urban settings

A 54 year-old man collapses in a café in the city of Tuscaloosa. The man is unresponsive and not breathing. EMS is activated and CRP is begun by bystanders. The first responder arrives via ambulance in 15 minutes with LifeBot 6 monitor and portable defibrillator. The patient is found pulseless and unresponsive. The patient is connected to the Defibrillator and the LifeBot 6 Telemedicine device. The patient is experiencing Monomorphic Ventricular Tachycardia. The patient defibrillated with the portable defibrillator within 60 seconds of arrival. CPR is continued, Oxygen therapy is initiated and a peripheral IV is secured. The patient converted to sinus rhythm, is moving all extremities, and has sluggish eye opening and spontaneous respirations. The patient is stable as the physician remotely views the vital signs via LifeBot 6 ICU Grade monitor. The physician reviews the 12 Lead EKG and notices ST segment elevation in lateral leads. The Tele-Emergency Physician instructs team to provide Aspirin, Amiodarone bolus and begin IVF. The patient continues to have ST segment elevation and a cardiologist is consulted and assesses the patient via the Lifebot 6. The cardiologist activates the cardiac catheterization lab and the patient is transported. The patient undergoes emergent stent placement and is discharged home two days after arrival.

