

TRAUMA TRAINING SYSTEM

This patent application is a continuation application of U.S. Ser. No. 11/739,064 filed on Apr. 23, 2007, which claims the benefit of U.S. Provisional Patent Application No. 60/794, 108, filed Apr. 24, 2006; U.S. Provisional Patent Application No. 60/811,779, filed Jun. 8, 2006; and U.S. Provisional Patent Application No. 60/822,888, filed Aug. 18, 2006. U.S. Ser. No. 11/739,064 is a continuation-in-part application of Patent Cooperation Treaty Application No. PCT/US2005/043771, filed Dec. 2, 2005 and published Jun. 8, 2006, which claims priority to U.S. Provisional Patent Application No. 60/635,432, filed Dec. 2, 2004. All of these patent applications are hereby incorporated by reference.

I. FIELD OF THE INVENTION

This invention relates to a system and method for simulating one or more hemorrhages in order to provide a more dynamic and realistic hemorrhage simulation in order to train medical personnel and other critical care givers, such as first responders, medics, and emergency medical technicians (EMTs) on treating hemorrhages.

II. BACKGROUND OF THE INVENTION

Trauma training systems, such as mannequins and other treatment simulation devices, are used to train individuals in a variety of medical situations. These medical situations may span a wide range of simulations—from cardiopulmonary resuscitation (CPR) to emergency room situations. Because of this wide range of applications, the complexity of many of these devices is impacted by the simulations intended to be performed with the device.

One of the more common simulation devices is the basic mannequin. A basic mannequin may be either a partial or whole human body—depending on the intended use—that allows a user, typically a trainee, to interact with it. For example, a CPR mannequin allows for chest compressions and assisted breathing but could not be used to simulate other medical situations.

At the other end of the trauma training device spectrum are much more complex devices that are typically mannequins that provide simulation capabilities for many different or more detailed simulations to be performed. These mannequins are typically controlled by preprogrammed software that allows a trainer to use a variety of optional simulations based on feedback from the users but requires extensive preparation prior to a simulation. These simulations provide an interactive “simulation tree” such that the simulation reacts to the choices made by the trainees. Consequently, these complex treatment devices are not suited for large training situations, at least in part because of the need to train the trainers on how to use the entire system. In addition, as the complexity of these treatment devices increases, so does the fragility of the devices such that the devices are not well-suited for in-field training and the ability to have multiple units for a mass casualty situation is limited given the high cost of these systems.

Other training situations use humans acting as injured individuals in mass trauma simulations with cards telling them what their respective injuries are and what to do. A problem with these simulations is that the injuries are static such as a wound being liquid soaked clothes possibly with make-up with the actor providing additional feedback and information in response to the treatment received.

Notwithstanding the usefulness of the above-described methods, a need still exists for a trauma training system that provides dynamic and realistic bleeding simulation to at least one simulated wound site in order to replicate a live traumatic bleeding situation.

III. SUMMARY OF THE INVENTION

In at least one exemplary embodiment, the invention includes a trauma training system for replicating at least one hemorrhage, the system comprising: a collapsible reservoir capable of storing fluid, a pump in fluid communication with the reservoir, at least one valve in fluid communication with the pump, a controller connected to the pump and the at least one valve, and at least one wound site detachably in fluid communication with the valve, wherein fluid is provided to the wound site to simulate a hemorrhage.

In at least one exemplary embodiment, the invention includes a trauma training system comprising: a mannequin, a reservoir housed in the mannequin, a flow controller in fluid communication with the reservoir and housed in the mannequin, and at least one wound site disposed on the mannequin and in fluid communication with the flow controller, wherein fluid is delivered from the reservoir to the wound site to simulate a hemorrhage.

In at least one exemplary embodiment, the invention includes a trauma training system comprising: a collapsible reservoir, a pump in fluid communication with the cavity of the reservoir, a valve connected to the pump, a controller connected to the pump and the valve, a housing containing the reservoir, the pump, and the valve, and at least one wound site detachably connected to the valve.

The invention in at least one embodiment provides an easy to use system with minimal training required prior to use while maintaining extreme flexibility for a simulation.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is described with reference to the accompanying drawings.

FIGS. 1A-1B illustrate block diagrams of exemplary embodiments of the trauma training system in accordance with the present invention.

FIG. 1C illustrates an extremity or foot of a trauma training system in accordance with an exemplary embodiment of the present invention.

FIGS. 2A-2C illustrate block diagrams of exemplary embodiments of the trauma training system in accordance with the present invention.

FIG. 3 illustrates a block diagram of a system in accordance with an exemplary embodiment of the present invention.

FIG. 4 illustrates an exemplary embodiment of the flow control system illustrated in FIG. 3.

FIG. 5 illustrates an alternative exemplary embodiment of the trauma training system in accordance with the present invention.

FIG. 6A illustrates a trauma training system in accordance with an exemplary embodiment of the present invention.

FIG. 6B illustrates the chest cavity of a trauma training system illustrated in FIG. 6A.

FIG. 6C illustrates the abdominal cavity of a trauma training system illustrated in FIG. 6A.

FIG. 7A illustrates the chest cavity of the trauma training system in accordance with an exemplary embodiment of the present invention.