

OBSTETRICS SIMULATION AND TRAINING METHOD AND SYSTEM

This application is the National Stage of International Application No. PCT/US2008/076725, filed on Sep. 17, 2008. The entire contents of which are incorporated herein by reference for all purposes.

I. FIELD OF THE INVENTION

An embodiment of the invention is in the field of obstetrics training in a variety of settings from small hospitals (or medical centers) to large medical complexes.

II. BACKGROUND OF THE INVENTION

Because there is no greater emotional and significant event than the birth of a child, physicians ensure that their practice patterns incorporate the most current and stringent evidence-based practices to promote patient safety. A recent report estimated that nearly 40% of all maternal deaths in the United States could be avoided with better obstetric care during emergencies. Berg C J, Harper M A, Atkinson S M, Bell E A, Brown H L, Hage M L, Mitra A G, Moise K J, Callaghan W M, Preventability of pregnancy-related deaths: Results of a state-wide review, *Obstet Gynecol* 2005, 106(6):1228-1234. In addition, obstetrics is the source of the greatest amount of money paid in legal claims across the Department of Defense with payments in the millions every year which are an obvious detriment to the military health care system's reputation with patients and the general public.

III. SUMMARY OF THE INVENTION

An embodiment of the invention provides implemented technology and integration of educational techniques with available resources in a manner that provides better training to a larger group of physicians and medical personnel.

In the modern practice of obstetrics, the military is in the position of having experts in both simulation training for obstetric emergencies and teamwork training. The military has the potential to train better and provide the safest environment possible with these resources.

Accordingly, an embodiment of the invention provides an obstetrics simulation system, comprising an articulating maternal birthing simulator. The maternal birthing simulator is a full size and full-body female having an intubable airway with a chest rise component, a forearm having a medication receiving component, and/or a fetal heart sound component. Additionally, the maternal birthing simulator includes a head descent and cervical dilation monitor, a placenta positionable in at least two locations, two or more removable dilating cervixes, and/or postpartum vulval suturing inserts.

An eclampsia simulation component is provided in a cavity of the maternal birthing simulator, wherein the eclampsia simulation component has a motor, a drive shaft connected to the motor, and a cam connected to the drive shaft. The cam engages and agitates an aperture within the cavity. The center of the cam is offset with respect to a center of the aperture. Specifically, rotation of the drive shaft and the resulting movement of the cam shakes the cavity of the maternal birthing simulator laterally from side-to-side.

At least one processor is provided for receiving input from the maternal birthing simulator, generating feedback based on the input, and sending the feedback to the maternal birthing simulator. The obstetrics simulation system further includes: a medical information (e.g., heart rate, temperature)

display connected to the maternal birthing simulator, a video recording and playback system connected to the processor, and/or an audio system connected to the maternal birthing simulator. Moreover, a grading component is connected to the processor.

At least one embodiment of the invention provides a method, including assembly of a simulation system having a simulator, a processor, and at least one display. The simulation system is provided along with documentation to a plurality of medical facilities within a system. Training on the use of the simulator, different simulations, and criteria for grading the performance on any given simulation is also provided. The training includes team training for conducting simulations using the simulation system. The simulations include breech vaginal delivery, umbilical cord prolapsed, eclampsia, neonatal resuscitation, operative vaginal delivery, postpartum hemorrhage, and/or shoulder dystocia.

More specifically, the breech vaginal delivery simulation assembles the birthing mannequin and the birthing fetus in a breech position. A medical staff is instructed that a patient feels pressure and has to push, wherein the patient is a birthing mannequin. The simulation observes whether of breech presentation of a birthing fetus is diagnosed from a cervical examination of the birthing mannequin by the medical staff. It is further observed whether a delivery preparation is performed by the medical staff, wherein the delivery preparation includes pushing the head of the birthing fetus until a buttocks of the birthing fetus begins to deliver in a sacrum anterior position. The simulation observes whether delivery maneuvers are performed by the medical staff. The delivery maneuvers are responded to with feedback during the simulation. The medical staff is debriefed and graded based on observations and predetermined scoring criteria.

The umbilical cord prolapse simulation assembles the birthing mannequin and a mobile cart having a touch-screen monitor. A medical staff is instructed that a patient's water has broken, wherein the patient is the birthing mannequin. The simulation observes whether the medical staff recognizes distress of the birthing fetus on the touch-screen monitor and observes whether the medical staff responds to the distress. If the medical staff waits for a vaginal delivery, the birthing fetus is kept within the abdomen of the birthing mannequin. The simulation observes whether the medical staff transfers the birthing mannequin to the operating room. The medical staff is debriefed and graded based on observations and predetermined scoring criteria.

The eclampsia simulation assembles the birthing mannequin and mobile cart with at least one touch-screen monitor. The birthing mannequin has a means for shaking to simulate a generalized seizure (e.g., the eclampsia simulation component). A medical staff is instructed that a patient has had a headache and it is getting worse, wherein the patient is the birthing mannequin. Moreover, the medical staff is instructed that the patient's blood pressure is increasing. A simulated eclamptic seizure is initiated by the simulator; and, the medical staff is observed for whether or not they perform assessment and intervention of the simulated eclamptic seizure. The intervention includes administering medications and/or rolling the patient. The simulated eclamptic seizure is continued. The medical staff is debriefed and graded based on observations and predetermined scoring criteria.

The neonatal resuscitation simulation assembles the birthing mannequin and the baby simulator. The medical staff is observed for recognition that the baby simulator is not breathing and has a heart rate less than 100 beats per minute. The simulation observes: whether the medical staff performs bulb suction, drying and stimulation of the baby simulator,