STRATEGIC OPERATIONS
HYPER-REALISTIC™ MEDICAL TRAINING

STOPS-Medical Newsletter Volume 1 Issue II

This Issue:

- **The Cut Suit - Open Surgery Simulator:** STOPS is now helping bring about a revolution in medical training, both military and civilian, via the Cut Suit and related Hyper-Realistic® technology.
- **Featured Product:** Advanced Surgical Skills Packages (ASSPs) are being developed to help train surgeons to perform Hyper-Realistic® simulated surgical procedures.
- **Case Study:** "Surgical Competence, a Crisis in US Health Care?" How the Cut Suit can help.

The Cut Suit - Open Surgery Simulator

Strategic Operations (STOPS), part of Stu Segall Productions TV/Movie Studio, helped revolutionize military training with the introduction of Hollywood film making techniques to create hyper-realistic, immersive simulations. Since 2002 STOPS has provided this kind of training support to more than 900,000 military and civilian first responders. In much the same way, STOPS is now helping bring about a revolution in medical training, both military and civilian, via the Cut Suit and related Hyper-Realistic® technology.

Standardized patient wearing the Cut Suit

STOPS defines Hyper-Realistic® as "the achievement of such a high degree of fidelity in the simulation of real world conditions in a simulation environment that participants willing suspend disbelief (that they are not in the real world), so as to emotionally (and physiologically measurably) become totally immersed and eventually stress inoculated."

STOPS developed the human-worn surgical simulator (Cut Suit) to provide Hyper-Realistic® continuum of care training and education. Instead of practicing on a manikin, first responders at the point of injury can perform life-saving procedures on a real person wearing the Cut Suit. The person can be transported to the emergency room where physicians can safely practice treating a live person wearing the Cut Suit with life-threatening injuries. And in the operating room, surgeons can perform realistic surgeries on live humans wearing the Cut Suit without injuring them.

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HYPER-REALISTIC™ MEDICAL TRAINING

More than 40 peer-reviewed scientific papers about the Cut Suit in the last 60 months (send us an email for a list) corroborate years of anecdotal evidence that Hyper-Realistic® immersion training produces a stress inoculation effect and that repetitive training in controlled, stressful situations enables people to lower their stress levels from the detrimental range to a more beneficial one (as measured by bio-markers). The result is also objectively measurable metrics of performance improvements (time to recognize a problem, time to resuscitate, amount of blood loss, critical errors made). Military and civilian curricula have been designed around the Cut Suit.

Numerous studies report that the quality of surgical education has deteriorated over the last two decades for a variety of factors, including the demise of the Halstead paradigm of residency structure, effectively ending the “see one, do one, teach one” era of surgery training on a live human due to patient safety and its ethical and legal issues.

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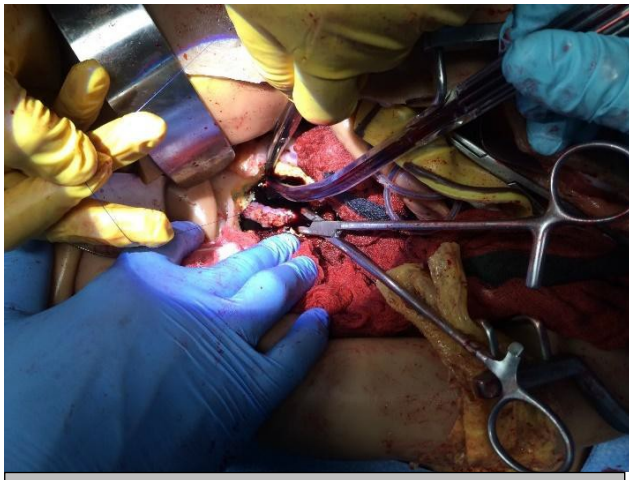
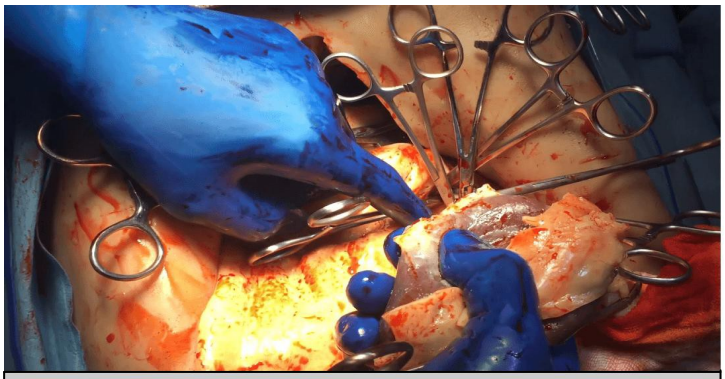


Surgeons and medical students repair a vena cava on the Cut Suit

Featured Product

Advanced Surgical Skills Packages (ASSPs) are being developed to train surgeons to perform Hyper-Realistic® simulated surgical procedures. Because of the higher fidelity and complexity, they are designed to be repaired at STOPS. The ASSPs are rented, shipped in pre-paid returnable containers, and repaired at STOPS and placed back into rental inventory.

STRATEGIC OPERATIONS
HYPER-REALISTIC™ MEDICAL TRAINING



Removing a damaged spleen - Cut Suit ASSP

ASSPs will drop into the Cut Suit as a plug-and-play module to provide high fidelity anatomy for specific surgical procedures such as splenectomy, liver packing, Pringle, perforated small bowel and a soon to be growing list of other trauma or pathology conditions requiring open surgery.

Besides the fidelity of the ASSP as a teaching model, the "life-threatening" trauma process can be slowed down or stopped (blood flow and vital signs) so the surgeon can instruct the student. The process can then be resumed. Pitfalls that may be encountered in the procedures are incorporated into the model to provide teaching moments, and unlike in real surgery, students are allowed to make mistakes so they learn how to recover from them. It is truly a return to the Halsted Method of "See one. Do one. Teach one." Watch Video Link Here

Case Study

Here is what retired surgeon Joan F. Tryzelaar, MD, FACS, FACCP says in "Surgical Competence, a Crisis in US Health Care?" http://www.cardiachealth.org/.

- The 80-hour workweek has effectively taken 6 months to 1 year of in-hospital time out of residency.
- 50% of the graduates had not performed even half of 121 "essential operations" (2005 data).
- Only 6 - 14% of the resident's total working time during a five-year training program is spent in the Operating Room learning those essential operations.
- 30 % of (graduates accepted into fellowship programs) were not prepared for operative cases and nearly two thirds could not work unsupervised for a significant period of time (Based on a survey of program directors):

"… Residents have markedly decreased experience with open surgery because of the conversion of open surgery to laparoscopic surgery. The problem here is that the complex open operations that were previously done by general surgical residents have not been replaced by comparable laparoscopic operations of equal complexity…"

- Fellowship/subspecialty training increased from 30% to more than 80%, in part from a feeling of inadequacy to pursue a more broad-based practice.
- Burnout is common among American surgeons (35%) and is the single greatest predictor of surgeons' satisfaction with career and specialty choice.
- General surgeons have decreased as a proportion of the total U.S. surgical workforce.
- 35% of general surgeons are >55 years old and capable of “open” procedures. In contrast, many younger surgeons are not, and will replace only a portion of their older colleagues when they retire. . .
- Fewer general surgeons will be available to treat an increasing demand for their services.
- Surgical graduates are unable to perform a broad range of open and laparoscopic operations competently, as a consequence of inadequate exposure during their residency training.
- Trauma and emergency surgery often requires the knowledge and ability to perform an “open” procedure, a skill that will be less and less available.
- In 2006, 30% (925) of the 3,107 US counties lacked a single surgeon and nearly 9.5 million Americans lived in those counties.

The Institute of Medicine 2000 report *To Err is Human: Building a Safer Health System* found that up to 98,000 people die each year in U.S. hospitals from medical errors (updated in 2013, this figure could be as high as 440,000). A study by researchers at Johns Hopkins Medicine published in BMJ in May 2016 found that medical errors are now the third leading cause of death in the U.S.

As a result, surgical residents in general are getting less surgical experience especially without a senior staff person with them, confidence levels are decreasing, certifying

examination pass rates are falling, and the quality of patient outcomes is deteriorating. This gap in training adequacy is being filled, less than adequately, by activities such as fellowships and the rise in simulation as an even more critical part of medical training activities. While the use of Human Patient Simulators (HPS) has dramatically increased in the last decade, the lack of open surgery simulators impedes progress in filling the training adequacy gap.

STRATEGIC OPERATIONS
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In 2010, STOPS participated in a medical training exercise at Camp Pendleton focused on simulating horrific war wounds on a live actor. After this exercise, STOPS recognized a limitation existed in medical simulations (where only external "Moulage" was available at the time) and thus it set out to develop a human worn simulator. This effort evolved into the patented Cut Suit—that requires medical providers to contend with performing procedures on - and *inside* – trauma patients.

The STOPS' Cut Suit enables real medical procedures to be performed on live humans (actors, role players, standardized patients), as well as on manikins, for Tactical Emergency Casualty Care (TECC) and for surgical trauma and pathology. The Cut Suit truly is a disruptive product and nothing like it currently exists in the Medical Simulation market today.

Medical Products

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