

**Simbionix**<sup>TM</sup>  
To Advance Clinical Performance 

**Why Simulation?**

孔子



# Confucius

*Chinese Philosopher (551 Bc - 479 Bc)*

I Hear And I Forget.  
I See And I Remember.  
I Do And I Understand.



# What Is Simulation ?

# Medical Simulation

Medical simulation is a **cross-disciplinary realistic and economical training and feedback method**, in which learners can repeatedly practice and review tasks and processes in lifelike circumstances, using physical or virtual reality models, ranging from low to high fidelity, to identify and **understand those factors which control the system** and/or predict its future behavior. We use simulation to **develop maintain and improve skills of health care providers until proficiency is achieved, without harming patients!**

# The History of Medical Simulation

# History of simulation in medical education

- Evidence suggests that **Egyptian surgeon priests may have simulated surgical procedures (such as rhinoplasty)** on cadavers around 2000 BC.
- One of the **first recorded use of a medical simulator** was a manikin created in the 17th Century by a Dr Gregoire of Paris (Buck, 1991). He used a **pelvis with skin stretched across**

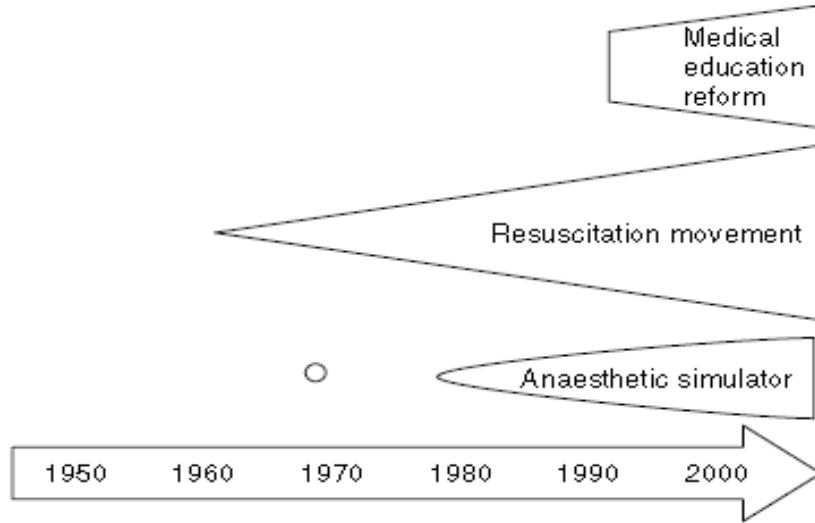
## Dr. William Smellie's Mechanical Labour Device

In 1739, Smellie created his own female models out of a **real pelvis, with ligaments, muscles, skin, artificial materials, and cloth dolls to simulate the fetus**. He shifted levers to imitate the actions of the maternal abdomen and the womb was represented by a glass carafe turned upside down.

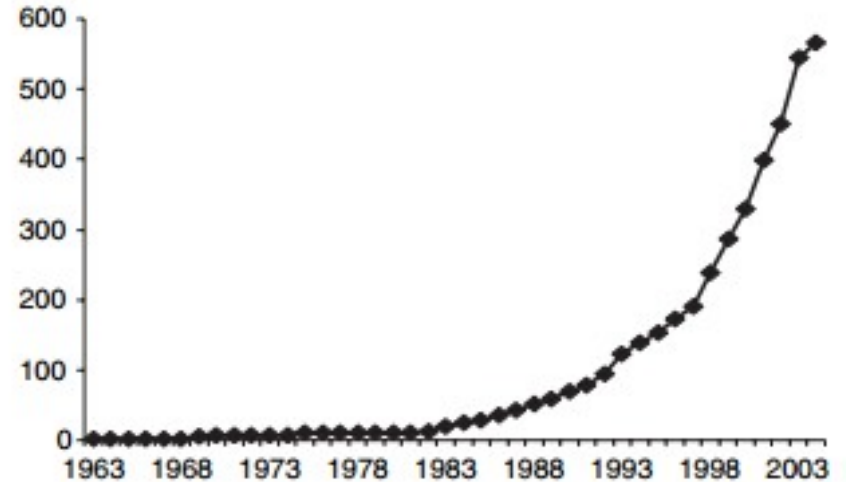
By 1747 he had 3 machines, with 6 'artificial children'



# Contemporary history of simulation in medical education



**Figure 1** The major movements of the late 20th century driving the adoption of simulation



**Figure 3** Cumulative growth in simulation literature (Source: Boston Simulation Centre)

**Bradley P. The history of simulation in medical education and possible future directions. Medical Education. 2006; 40: 254-262**

# Medical Errors: A Global Pandemic



# Medical Error

A medical error is a **preventable adverse effect of care**, whether or not it is evident or harmful to the patient, and generally occurs when a health-care provider **chose an inappropriate method of care or the right solution of care executed incorrectly**. Medical errors are often described as human error in healthcare.

## Types of Medical Errors

- *Misdiagnosis*
- *Medication Error*
- *Medical Procedure Error*
- *Negligence & Treatment Errors*
- *Incorrect Laboratory Results*
- *Equipment Malfunction and Communication Error*

<http://www.rightdiagnosis.com/mistakes/types.htm>

[http://en.wikipedia.org/wiki/Medical\\_error](http://en.wikipedia.org/wiki/Medical_error)

# Causes of Medical Errors

- **Under-trained** staff & **Incompetence**
- **Overworked** doctors and medical staff
- **Slow adoption of new technologies**
- **Failure to report** medical errors for fear of lawsuits
- **Under-funded** medical care
- **Human error**

Adverse outcomes from errors usually do not happen because of isolated incidents but actually reflect **system problems**.

# Statistics - USA

- 1997 - **180,000 deaths annually from medication errors and adverse reactions** [E. G. Holland, F. V. Degruy, Drug-Induced Disorders, American Family Physician, 15:7, 1997]
- 1999 - **44,000 to 98,000 deaths annually from medical errors** (Top 10 death causes, IOM, 99)
- 2000 - **225,000 deaths annually from medical errors**, including 106,000 deaths due to "non-error adverse events of medications". [Barbara Starfield, Is US Health Really the Best in the World?, JAMA, 2000]
- 2004 - **195,000** people die annually due to potentially preventable, in-hospital medical errors, according to a study of 37 million patient records. Health Grades Inc. "Patient Safety in American Hospitals" 2004
- In 2010, the Office of Inspector General for Health and Human Services said that bad hospital care contributed to the deaths of 180,000 patients in Medicare alone in a given year.
- Now comes a [study in the current issue](#) of the Journal of Patient Safety that says the numbers may be much higher – [between 210,000 and 440,000 patients](#) each year who go to the hospital for care suffer some type of preventable harm that contributes to their death, the study says

**These numbers make medical errors the 3<sup>rd</sup> medical death cause, !!!preceded only by heart disease and cancer**

<http://chriskresser.com/medical-care-is-the-3rd-leading-cause-of-death-in-t>

<http://www.timesunion.com/local/article/Dead-by-mistake-547875.php#>

# A System Striving to Improve

# Work Load Issues

Numerous studies show the implications of **long work hours on decision making, performance and overall rate of medical errors**. Extended-duration work shifts were associated with an **increased risk of significant medical errors, adverse events, and attentional failures** in interns across the United States.

[Barger LK et al. (2006) Impact of extended-duration shifts on medical errors, adverse events, and attentional failures. PLoS Med 3(12): e487]

or more extended-duration shifts per month, compared to months with no extended-duration shifts) cannot account for the observed increase in the rate of events. **For months with between one and four extended-duration shifts and for months with five or more extended-duration shifts, fatigue-related adverse events increased by ~450% and ~700%, respectively. For months with five or more extended-duration shifts, fatigue-related adverse events resulting in a fatality increased by ~300%.**

We also recorded the frequency of both fatigue-related and

# Improvement Strategies

## Reducing Work Load

Interns made substantially more serious medical errors when they worked frequent shifts of 24 hours or more than when they worked shorter shifts. **Eliminating extended work shifts and reducing the number of hours interns work per week can reduce serious medical errors** in the intensive care unit.

[\[Effect of reducing interns' work hours on serious medical errors in intensive care units. Landrigan et al, N Engl J Med. 2004 Oct 28;351 \(18\):1838-48\]](#)

**Table 3. Incidence of Serious Medical Errors.**

Variable	Traditional Schedule	Intervention Schedule	P Value
	<i>no. of errors (rate/1000 patient-days)</i>		
<b>Serious medical errors made by interns</b>			
Serious medical errors	176 (136.0)	91 (100.1)	<0.001
Preventable adverse events	27 (20.9)	15 (16.5)	0.21
Intercepted serious errors	91 (70.3)	50 (55.0)	0.02
Nonintercepted serious errors	58 (44.8)	26 (28.6)	<0.001
<b>Types of serious medical errors made by interns</b>			
Medication	129 (99.7)	75 (82.5)	0.03
Procedural	11 (8.5)	6 (6.6)	0.34
Diagnostic	24 (18.6)	3 (3.3)	<0.001
Other	12 (9.3)	7 (7.7)	0.47
<b>All serious medical errors, unit-wide</b>			
Serious medical errors	250 (193.2)	144 (158.4)	<0.001
Preventable adverse events	50 (38.6)	35 (38.5)	0.91
Intercepted serious errors	123 (95.1)	63 (69.3)	<0.001
Nonintercepted serious errors	77 (59.5)	46 (50.6)	0.14
<b>Types of serious medical errors, unit-wide</b>			
Medication	175 (135.2)	105 (115.5)	0.03
Procedural	18 (13.9)	11 (12.1)	0.48
Diagnostic	28 (21.6)	10 (11.0)	<0.001
Other	29 (22.4)	18 (19.8)	0.45

Airline pilots only permitted to fly:  
 8 hours in a 24 hours period  
 30 hours in 7 days  
 100 hours in a month  
 up to 1,000 hours in a calendar year  
 by FAA regulation.

# The Importance of Error-Reporting & Transparency

In aviation, the **error reporting system isn't a punitive one, but one in which understanding why operational errors occur and how to prevent them takes precedent.**

<http://www.ainonline.com/aviation-news/aviation-international-news/2009-07-27/controller-error-reporting-changed>

In the end, however, **what we most need is a characteristic not described by Hippocrates—the ability of care givers to admit and accept fallibility.** Furthermore, the organizations in which care is provided **must create environments in which it is “safe” to admit error and safe as well to explore why the error occurred.** In a sense, we need to extend the peer review collegiality inherent in the classic morbidity and mortality conference to the context of the entire organization. Simply stated, **if we truly expect to improve the safety of patient care, those who directly provide the care must engage in the improvement process and feel safe in doing so.**

[Accreditation's role in reducing medical errors, Dennis S O'Leary](#)

One of the major reasons medical errors occur is **lack of appropriate information for healthcare providers at the point of care**

Better availability of clinical information is one of the best means we have to reduce medical errors

[HIMSS Position Statement Medical Error Reporting 2003](#)

# Morbidity and Mortality

A key element in promoting quality improvement and patient safety. Objectives:

1. **Identify** and present patient cases involving **adverse outcomes**
2. **Analyze relevant facts** in a systematic and **non-punitive manner** to identify **contributing or causative factors** or system-based issues and identify areas for improvement in patient care, at system level and individual level.

**With the near-absence of error disclosure and discussion during medical training, without this tool residents may be ill-prepared to address errors.**

M&M, therefore, has a **vital role in the future of patient safety** because of its unique place as an **educational forum for reporting, addressing, and learning from medical errors**



# Why Simulation?

## Acute lesson from Aviation

# Aviation vs. Medicine

First flight – 1903 → first use of simulator – 1909 → today simulation is mandatory in assessment and accreditation of pilots worldwide.

Medicine – since the dawn of time → The WHO recommends the use of simulation in medical education – 2009.

[\[http://www.who.int/patientsafety/education/curriculum/en/index.html\]](http://www.who.int/patientsafety/education/curriculum/en/index.html)

Several key factors contribute to the high safety profile of the aviation industry:

Constantly improving mechanical reliability of aircrafts and systems

Good communication between crew members using a set of predefined keywords – Crew Resource Management (CRM)

Incident reporting culture – not to punish, but to learn!

Strict training programs – vast mandatory use of simulators



Mrs. Chase, 1911 – 1<sup>st</sup> commercial simulator,  
.designed for training nurses

[http://www.nсна.org/Portals/0/Skins/NSNA/pdf/Imprint\\_FebMar08\\_Feat\\_MrsChase.pdf](http://www.nсна.org/Portals/0/Skins/NSNA/pdf/Imprint_FebMar08_Feat_MrsChase.pdf)

# Aviation vs. Medicine

The classic example of simulation's superior consistency and efficiency is pilot training:

- Learning to “**fly around**” in a real airplane require **substantial resources** of time and money, both **avoided** using **flight simulators**.
- Pilots need to **fly for many years to encounter all the conditions** that can be produced in today's simulators in a few sessions.
- In aviation training **customized training** represents the future of aviation training; focusing on **maximizing skills and abilities of each individual pilot in the most efficient way**.
- With simulator-based training, all pilots get the same educational experience and learn to respond to problems the same way. **Pilots who have had simulated training are safer than those pilots who haven't had it. It's a tried-and-true type of trainer.**

The airline industry's **remarkable improvement in safety over the past 50 years** is attributed to **widespread adoption of simulation training & implementation of state-of-the-art safety and error reduction programs.**

# Aviation vs. Medicine

In 1970 a landmark article by Prophet & Boyd about aviation training procedures detailed six conditions why they simulated training is needed:

- 1) *A high level of difficulty of skills*
- 2) *A high criticality of skills or tasks*
- 3) *Infrequent practice of skills*
- 4) *Difficulty teaching in the operational environment*
- 5) *An imperative for safety, and*
- 6) *A high cost of using operational equipment for training.*

**All six criteria are crucial elements in MIS skills training.**

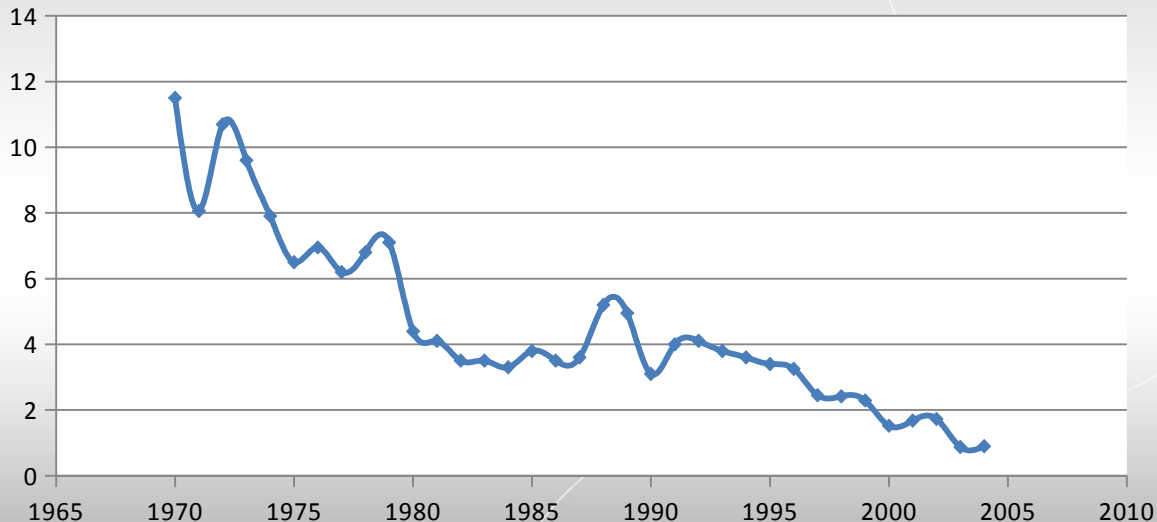


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Simulation

# What can we learn from the aviation industry?

Average # of fatal accidents per million departures



<http://www.airdisaster.com/statistics/yearly.shtml>

The aviation industry, where critical decisions have to be made under stress, has an enviable record of dealing with millions of passengers .with minimal mishaps

<http://www.nursezone.com/nursing-news-events/more-features.aspx?ID=18>

023

# Aviation vs. Medicine

## Similarities

- High-risk & high-tech industries
- Low tolerance to errors
- Should have lower tolerance to not learning from errors
- Diverse skills and personality characteristics required
- Concurrent task demands and high information load
- Extended period of specialized training and high cost to deliver

## Deep Cultural Differences

- Admission and preliminary screening
- Assessment and safety
- Reporting and debriefing
- Training and certification
- Mandatory post-licensing education vs. CME
- Fragmented safety regulatory environment
- Risk of fatality to passengers and self Vs. single patient

## Error, stress, and teamwork in medicine and aviation: cross sectional surveys

J Bryan Sexton, Eric J Thomas and Robert L Helmreich. [BMJ](#). 2000 Mar 18;320(7237):745-9

### **30000 cockpit members and 1033 operating room & ICU personnel (12 medical institutions in USA and Europe)**

- Medical staff more likely than cockpit crew to deny the effect of fatigue on their performance (70% vs 26%)
- 97% of crew members advocated flat hierarchies vs. 55% of surgeons
- 100% crew personnel acknowledged the make mistake vs. 30% of medics
- 100% crew found it easy to discuss/report mistakes vs. 56% of medics



# Simulation Training in Anesthesia

# The Case of Anesthesia

Observations in the 70's suggested the **top 2 factors caused critical incidents:**

- 1. Inadequate total experience**
- 2. Inadequate familiarity with equipment or devices**

Leading to the **APSF (Anesthesia Patient Safety Foundation)**. **Regulation and standardization** became key component in both training of medical professionals and manufacturing of devices.

Often cited as a the first medical specialty where **safety is a central focus** with dramatic improvements in mortality and morbidity due to technological advancements.

In recent years, computer technology has led to the creation of full scale manikin simulators. **Like pilots, anesthesiologists should be trained in emergency situations using a simulator, and be prepared to treat the rare and unusual anesthetic problem.**

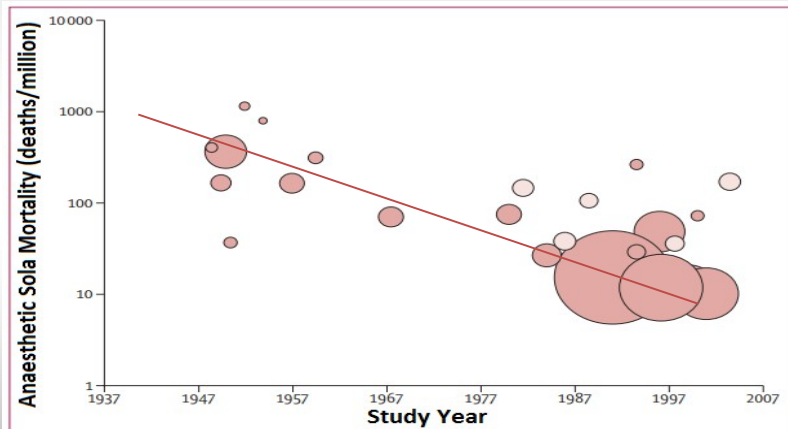
The American anaesthetist Gaba said: 'No industry in which human lives depend on the skilled performance of responsible operators has waited for unequivocal proof of the benefit of simulation before embracing it.' (1992)

[\[http://expertpages.com/news/mortality\\_anesthesia.htm\]](http://expertpages.com/news/mortality_anesthesia.htm)

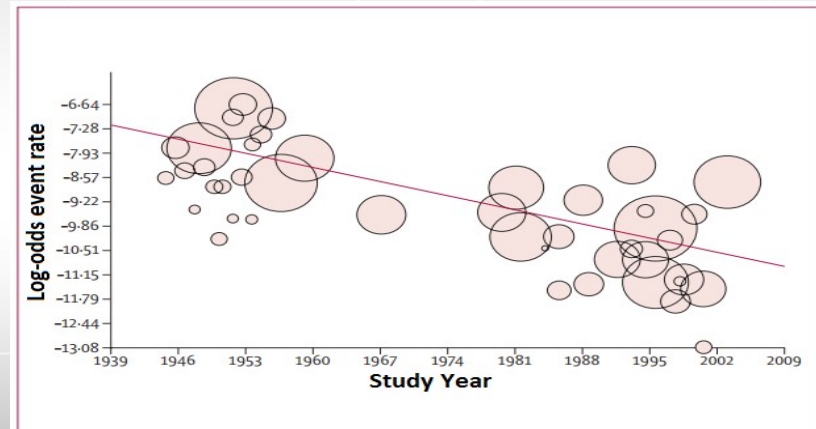
[\[Preventable anesthesia mishaps: a study of human factors. Cooper JB, Newbower RS, Long CD, McPeck B.\]](#)

# The Case of Anesthesia

Risk of anesthetic sole mortality decreased progressively over the decades, from 357 per million before the 1970s, to 52 per million in the 1970s–80s, and 34 per million in the 1990s–2000s. In a weighted meta-regression, this reduction over time was significant.



**Figure 2: Event rates for anaesthetic sole mortality by year**  
Every circle represents a study; the circle size is representative of the study's population size. The year represents the median year if the study reported a range of years. Low-income and middle-income countries are shown in light red (human development index [HDI]<0.8) and high-income countries in dark red (HDI≥0.80).



**Figure 3: Meta-regression for risk of anaesthetic sole mortality by year**  
Every circle represents a study; the circle size is representative of the weight of that study in the analysis. The relation between mortality and year of study was significant, with a significant decline over the decades (slope -0.053, 95%CI -0.058 to -0.049; p=0.000001).

[Perioperative and anaesthetic-related mortality in developed and developing countries: a systematic review and meta-analysis. D Bainbridge, J Martin, M Arango](#)

[, D Cheng. Lancet 2012; 380: 1075-81

# What is Minimally Invasive Surgery (MIS)?

# What is MIS?

A Minimally Invasive Surgery procedure is **less invasive than open surgery used for the same purpose**. It typically involves the use of laparoscopic devices and remote-control manipulation of instruments with indirect observation of the surgical field through an endoscope or similar device, carried out through the skin or through a body cavity or anatomical opening.

***:For the patient, MIS means***

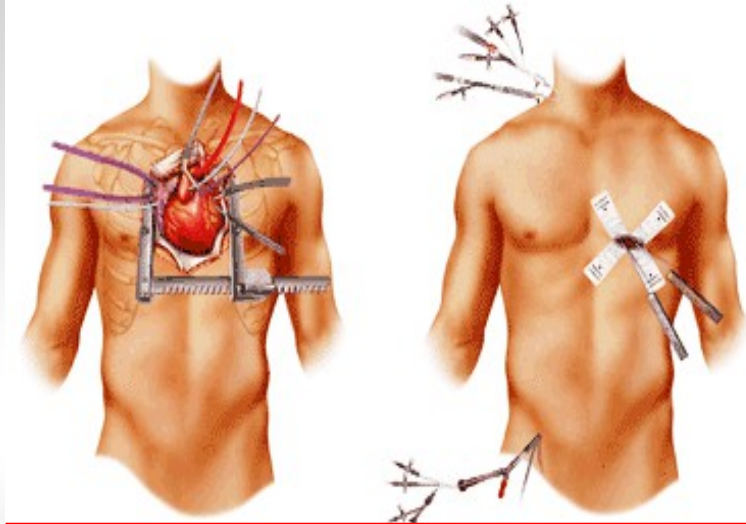
**Increased safety** – smaller incisions, less trauma, less blood loss, less pain, reduced risk of infection

**Decreased scarring** – most incisions just take a stitch or two to close

**Faster recovery** – traditional surgery recovery time typically takes 6-8 weeks, whereas in MIS procedures recovery time is only two

**Decreased length of hospital stay** – most MIS procedures are associated with a 23 hour discharge or scheduled outpatient surgery

**!Less Expensive**

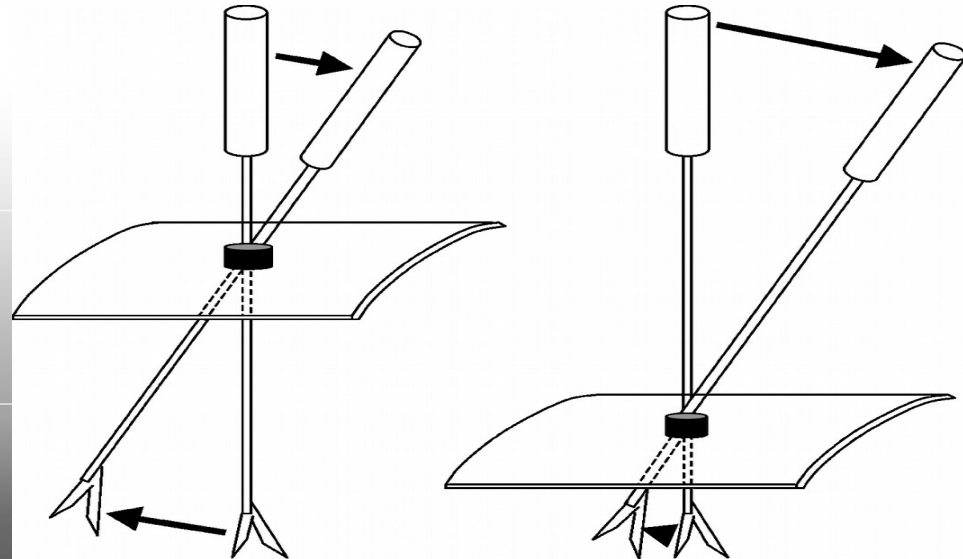


**MIS is more difficult from the surgeon's perspective with arguably a greater challenge in acquiring and measuring technical skill relative to cognitive skill**

# MIS challenges are psychomotoric & conceptual:

- Long instruments, far from hands, fixed access, restricted range of motion
- Use of non-dominant hand, amplified or reversed movements. Small inaccuracy in motion is translated into a larger inaccuracy in the treated area.
- Monocular vision, magnification, limited depth perception, lack of peripheral vision
- Proprioception – Good eye-hand coordination is required.
- Dampen tactile feedback
- Overcoming Pivoting/Fulcrum effect.

MIS requires **special skills** and thus **special .training methods**



# MIS Contemporary Training Methods

# Contemporary MIS Training Methods

- Laparoscopic proficiency is only realized after sufficient practice in MIS environment
- The traditional “see one, do one, teach one” does not apply – learning begins with “do one



Mannequins



Endo/Box Trainers



Animal Models



Humans



VR Simulators

], [<http://www.oobject.com/medical-manikins/geriatric-patient-care-simulator/3023/>]

] , [[http://media.tumblr.com/tumblr\\_lh53bnLrKd1qzwowd.jpg](http://media.tumblr.com/tumblr_lh53bnLrKd1qzwowd.jpg)] , [[http://www.medwow.com/laparoscopic-trainer.xth1417\\_200\\_160.jpg](http://www.medwow.com/laparoscopic-trainer.xth1417_200_160.jpg)]

[<http://www.lumosity.com/blog/surgical-gaming/>]



# Animal Labs

Anesthetized and ventilated animal (expensive)

Supply, ethical and legal limitations

Mandatory as a prerequisite before the OR in some places

Procedure can be preformed once

PETA's urge the use of non-animal alternatives (i.e. simulators)

ACS no longer use live animals in clinical training programs, endorsing simulators



!"Don't Use Him. Use a SIM"



# Box/Endo/Pelvic/Video Trainer

Endoscopic basic skills



Endo (FLS)

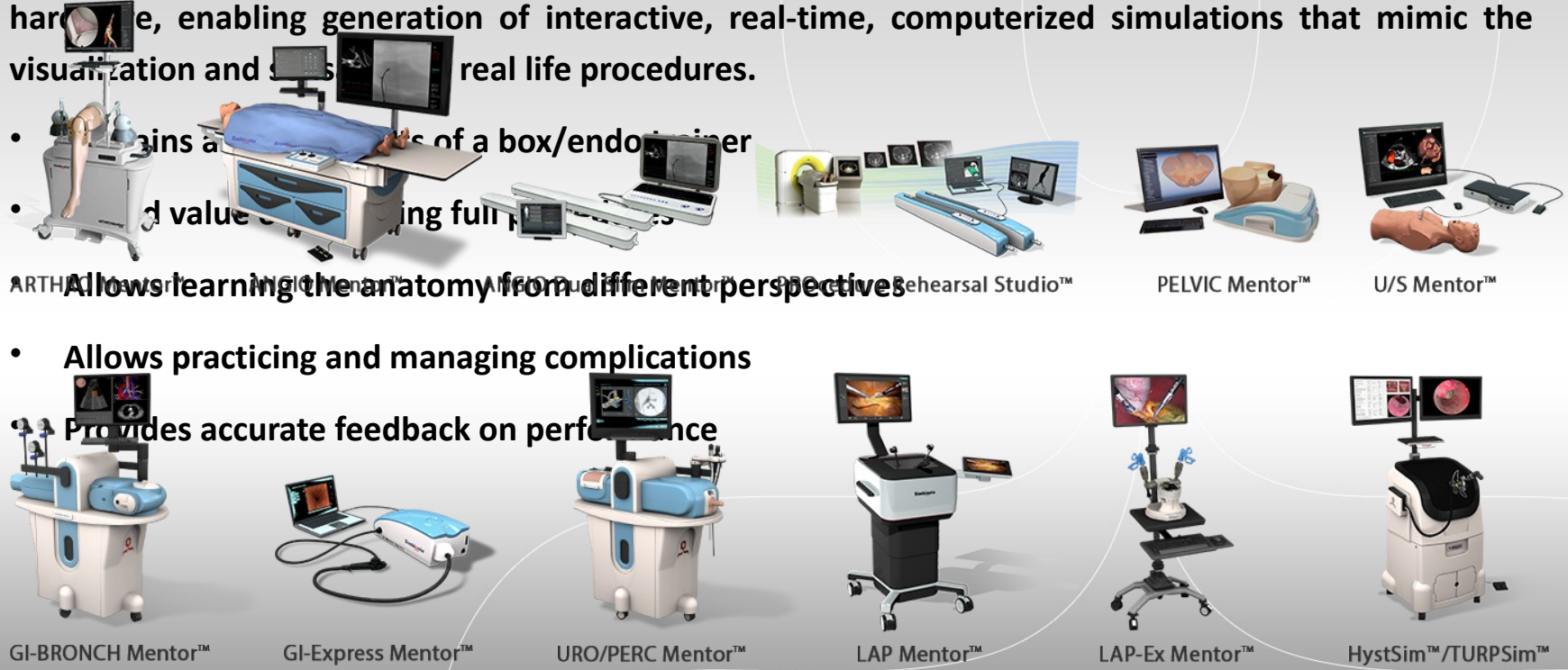
# Virtual Reality Simulation

A sophisticated and complex algorithm-based software technology, combined with specialized hardware, enabling generation of interactive, real-time, computerized simulations that mimic the visualization and steps of real life procedures.

- Gains additional value of a box/endo trainer
- Provides full

Allows learning the anatomy from different perspectives

- Allows practicing and managing complications
- Provides accurate feedback on performance



# Traditional Training Vs. SBME

# Traditional Training

In the real world of health care, delivering full medical training in clinical environments is simply unreal

**Reduced Trainee Work Hours**

**Decreased number of Inpatients**

**Intolerance for the use of **Live Animals** & Risk to Patients**

**Global Demand for **Demonstrated Proficiency****

**Increasing **Range of Procedures & Instruments** and **complexities****

**Get out of Trouble” **Procedures for Specialists**“**

**Document Maintenance of Skill**

**Shortening residency/fellowship programs**

**Reduced availability of **OR's****

**Increased attention and demand for **patient safety** outcome**

**Medico-legal aspects**

# Simulation-Based Medical Education (SBME) can provide:

- !Ability To Practice In A **Controlled Risk-free Environment**. Risks To Patients And Learners Are Avoided
- .Consistent Educational Experiences; **Exposure To Clinical And Challenging Variations** From Actual Cases Scenarios
- .A Mechanism For **Repeating Simulated Basic Skills And Full Procedures**
- .**Task-driven Or Partial (Specific Clinical Situation/Skill) Training**. **Error-driven** Education
- . Develop **Basic Proficiency** And Accelerate **Knowledge Transfer**
- .Realistic And **Accurate Behavior Of Internal Organs/Tissues And Tools**
- .Exposure To **Advanced Procedures & Complication Management**
- .Monitoring **Objective Performance Metrics For Assessment**
- .**Able To Alter The Degree Of Difficulty**

**Develop Standardization** Of Surgical Techniques

Retention And Accuracy Is Increased Thus **Transfer Of Training** From Classroom To Real Situation Is Enhanced

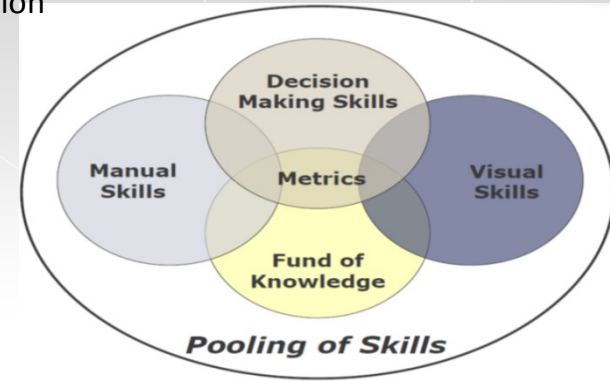
.**Integrate Into A Curriculum**, Adapt To Multiple Learning Strategies And **Reduce Overall Training Time**

.**Tailored Individualized Or Team** Active Learning. Improves Functioning As A Team

Validity As An **Approximation Of Clinical Proficiency**, Evaluate Performance & Diagnose Educational Needs

**Shortening Learning Curves And Remove Them From The OR**

**Reduce Training Costs And Human Errors (Lower Costs Compared To Medical Errors)**



# Medical Simulation Efficacy Evaluation

# Medical Simulation Efficacy Evaluation

To evaluate the efficacy of Simulation, we need to explore two components:

1. **Learning Curve** is measured by improvement of performance of a specific task.
2. **Transfer Validity** relates to the degree in which simulation-acquired skills are implemented clinically.

1. Gurusamy et al. Systematic review of randomized controlled trials on the effectiveness of virtual reality training for laparoscopic surgery. *Br J Surg*. 2008.
2. Gurusamy et al. Virtual reality training for surgical trainees in laparoscopic surgery. *Cochrane Database Syst Rev*. 2009.
3. Sutherland et al. Surgical simulation: a systematic review. *Ann Surg*. 2006.
4. Grantcharov et al. Randomized clinical trial of virtual reality simulation for laparoscopic skills training. *Br J Surg* 2004.
5. Scott DJ et al. Laparoscopic training on bench models: better and more cost effective than operating room experience? *J Am Coll Surg* 2000.
6. Sturm LP et al. A systematic review of skills transfer after surgical simulation training. *Ann Surg*. 2008.



# Medical Simulation Efficacy Evaluation

Simulators should evaluate **what is learned and how well it is learned by the trainee**. Issenberg et al identified **ten characteristics that lead to effective learning in the simulation environment**. Combined with **learner-centered** evaluation strategies could shift the focus of .evaluation in surgical simulation from the machine itself to the surgeons to be trained

Feature	Explanation
Feedback	.Provision of information that is evaluative and educational is the most important feature of simulation-based medical education
Repetitive practice	.The opportunity to apply and test skills as often as necessary is a key feature in high-fidelity simulations
Curriculum integration	.Simulation exercises should be incorporated into the educational curriculum
Range of difficulty level	.Learners should be presented with a diversity of simple to difficult tasks to accommodate various skill levels
Multiple learning strategies	.The simulator should be capable of adapting to and addressing a variety of learning strategies
Clinical variation	.Simulators that capture a wide variety of clinical conditions are more useful than those that present a narrow range
Controlled environment	.Regulated conditions allow learners to make, detect, and correct mistakes without adverse consequences
Individual learning	.Reproducible, standardized experiences allow active, rather than passive, learning
Define outcomes	.Clearly stated goals with tangible outcome measures lead to mastery
Simulator validity	.Though simulator validity is deemed important, there exists weak evidence for the direct correlation of this feature to effective learning










# Medical Simulation Efficacy Evaluation

**Direct observation** by an expert assessor that evaluates the performance according to a Global Rating Scale or Checklist

**VR simulator can analyze pre-defined performance** parameters (Safety, Economy, Time etc.) and **Motion Analysis** & Raw Data (# of movements, speed, distance etc.)

## Single Case Report

Client Administrator   Laparoscopic Essential Tasks Module   Task 1: Peg Transfer   Session 1   27/06/2011 18:01:33

Metric	Value	Graph
<b>Main List</b>		
Number of movements of right instrument	165	
Number of movements of left instrument	163	
Total path length of right instrument (cm)	354.1	
Total path length of left instrument (cm)	313.1	
Average speed of right instrument movement (cm/sec)	4.1	
Average speed of left instrument movement (cm/sec)	4.1	
<b>Pegs Not Transferred</b>	0	
Pegs Transferred - Forward (Non-dominant to Dominant Hand)	6	
Pegs Transferred - Reversed Process (Dominant to Non-dominant Hand)	6	

### Number of movements of right instrument

From 27/06/2011 To 27/06/2011 (3 Sessions)



Print

Close

# Integrating VR Simulation in Medical Training

# Simulators – See one, Do One, Simulate One!

Satava (1995) called for early adoption of VR as a training tool in medicine but initial lack of robust scientific evidence to support the use of VR for skills training and the lack of knowledge of how to effectively apply simulation to a surgical skills training program are the 2 most likely reasons for delayed adoption of this . technology

It took a multidisciplinary team that drew from more than *50 years of sound research on aviation simulation and 100 years of behavioral sciences research* to demonstrate the power of simulation for . surgical training

## ?Simulators: Education or Training

:Although closely related, they are not the same though often used interchangeably

**Education** usually refers to the *communication or acquisition of knowledge or information*—

**Training** refers to the *acquisition of skills (cognitive or psychomotor)*—

**Individuals need** to: know what to do, what not to do, how to do what they need to do, and how to—

. identify when they have made a mistake

**Trainers need** to know how the trainee is progressing and/or where they are on their learning curve, not—

. just psychomotor learning but cognitive

*Simulators alone provide only part of a curriculum and of the training solution confronting residency programs and credentialing committees around the world. Their power can only be truly realized if they .are integrated into a well-thought-out curriculum*

# Simulators – Perfect Practice Makes Perfect!

Airlines have used simulation for decades to teach, train, test and certify competency. Flight simulation has earned its invaluable place in the world of flight training; **not just for the potential cost savings when compared to live flight drills, but as a means to present pilots with scenarios that are impossible or too dangerous to replicate while flying an aircraft.**

**Interaction is associated with learning  
.achievement & retention of knowledge**

**Participants learned faster and had better  
attitudes when they used an interactive  
.instructional environment**

**Interaction improves learning performance  
.since it encourages elaborative processing**

## Retention of Knowledge

Teach Others - 90%

Learn By Doing - 75%

Discussion Groups - 50%

Demonstration - 30%

Audio - 20%

Visual - 5%

Lecture - 5%

]Andersen Consulting[

# A proposed template for developing a curriculum:

1. **Didactic** teaching of relevant knowledge (i.e. anatomy, pathology, physiology);
2. Instruction on the **steps of the task or procedure**;
3. Defining and illustrating **common errors**;
4. **Test** of all previous didactic information to ensure the student understands all the cognitive skills before going to the technical skills training and in particular to be able to determine when they make an error;
5. **Technical skills** training on the simulator;
6. Provide immediate **feedback** when an error occurs;
7. Provide **summative feedback** at the completion of a trial;
8. **Repeat skill training** while providing evidence at the end of each trial of progress (graphing the “learning curve”), with reference to a proficiency performance goal that the trainee is expected to attain.

**While the above is a proposed template, it includes in a stepwise fashion all components published in the literature that comprise a comprehensive & validated training curriculum.**

# Using Simulation To Advance Clinical Performance (Validations Overview)

# Validation of Simulation in Medical Training

## T-2

Simulation has been demonstrated to **lead to improvements in medical knowledge, comfort in procedures, and improvements in performance** during retesting in simulated scenarios. Simulation has also been shown to be a **reliable tool for assessing learners** and for teaching topics such as teamwork and communication. Simulation in medical training is here to stay. [[The Utility of Simulation in Medical Education: What Is the Evidence?, Yasuharu Okuda et al., MOUNT SINAI JOURNAL OF MEDICINE, 76:330–343, 2009](#)]

**Skills in laparoscopic surgery can be increased** by proficiency-based procedural VR simulator training. There is **substantial evidence** to support the use of VR simulators in laparoscopic training. [[The efficacy of virtual reality simulation training in laparoscopy: a systematic review of randomized trials. Larsen CR, Oestergaard J, Ottesen BS, Soerensen JL., Acta Obstet Gynecol Scand. 2012 Jun 13. doi: 10.1111/j.1600-0412.2012.01482.x.](#)]

## T-3

Simulation-based mock codes **significantly correlate with improved pediatric patient cardiopulmonary arrest survival rates**. Main finding: **Survival rates increased to approximately 50%**, correlating with the increased number of mock codes. [[Simulation based medical education: an opportunity to learn from errors. Ziv A et al., Med Teach. 2005;27\(3\):193-199](#)]

The basic assumption underlying SBME is that increased practice in learning from mistakes and in error management in a simulated environment **will reduce occurrences of errors in real life** and will provide professionals with the **correct attitude and skills** to cope competently with those mistakes that could not be prevented.

[http://casemed.case.edu/ctsc/tools/welcomepacket/8-1-WP\\_ProjectsandTranslationalResearch.pdf](http://casemed.case.edu/ctsc/tools/welcomepacket/8-1-WP_ProjectsandTranslationalResearch.pdf)



# Validation of Simulation in Medical Training

## ? Abstract 1: Does SBME with DP Yield Better Results than Traditional Clinical Education

A Meta-Analytic Comparative Review of the Evidence. [Dr. William C. McGaghie](#), [Dr. S. Barry Issenberg](#), [Ms. Elaine R. Cohen](#), [Dr. Jeffrey H. Barsuk](#), and [Dr. Diane B. Wayne](#). Acad Med. Author manuscript; available in PMC 2012 June 1

**SBME with DP is superior to traditional clinical medical education in achieving specific clinical skill acquisition goals.** SBME is a complex educational intervention that should be introduced thoughtfully and evaluated rigorously at training sites. Further research on SBME with DP in medical education is needed to amplify its power, utility, and cost-effectiveness

## Abstract 2: Prospective, Randomized Assessment of Transfer of Training (ToT) and Transfer Effectiveness Ratio (TER) of Virtual Reality Simulation Training for Laparoscopic Skill Acquisition

Feb 19 [Ann Surg.](#) [Satava RM](#), [McGlade K](#), [Bunting BP](#), [Jordan-Black JA](#), [Seymour NE](#), [Gallagher AG](#) /2013

Experienced and novice laparoscopists trained on the simulator **performed significantly better than their controls, thus demonstrating ToT.** Their performance showed a TER between 7% and 42% from the virtual to the real tasks. Simulation training **impacted most on procedural error reduction** in both studies (32- 42%). The correlation observed between the VR and real-world task performance was  $r > 0.96$  (Study 2). VR simulation training offers a powerful and effective platform for training safer skills

# Validation of Simulation in Medical Training

## **Abstract 1: Effect of virtual reality training on laparoscopic surgery (RCT)**

Laparoscopic surgery skills can be increased in a clinically relevant manner using proficiency based virtual reality simulator training. The **performance level of novices was increased to that of intermediately experienced laparoscopists** and **operation time was halved** (VR group was 12 minutes & control group 24). Simulator training should be considered before trainees carry out laparoscopic procedures.

## **Abstract 2: The efficacy of VR simulation training in laparoscopy: a systematic review of randomized trials (2012)**

**Operation time was reduced by 17%-50%**. Simulators offering training for complete procedures are more efficient than simulators offering only basic skills training. Skills in laparoscopic surgery can be increased by proficiency-based procedural VR simulator training. There is **substantial evidence (grade IA - IIB) to support the use of VR simulators** in laparoscopic training. Larsen et al. [Effect of virtual reality training on laparoscopic surgery: randomised controlled trial. BMJ 2009](#)

## **Abstract 3: Develop and validate an ex vivo comprehensive curriculum for a basic laparoscopic procedure.**

STAC group outperformed the conventional group that demonstrated a significant learning curve in the OR. STAC-trained residents had superior technical proficiency in the OR and significantly higher nontechnical skills compared with conventionally trained residents, **shifting the learning curve of basic laparoscopic procedure from the operating room into the simulation laboratory.**

## **Abstract 4: Randomized controlled trial of virtual reality simulator training: transfer to live patients.**

Residents trained on a colonoscopy simulator prior to their first patient-based colonoscopy **performed significantly better in the clinical setting than controls, demonstrating skill transfer to live patients.** The simulator's performance metrics showed limited concurrent validity, suggesting the need for further refinement.

# Validation of Simulation in Medical Training

## **Abstract 5: A Randomized Controlled Trial Evaluating Endoscopic and Laparoscopic Training in Skills Transfer for Novices Performing a Simulated NOTES Task (Mar. 2013. Imperial College, London, UK.)**

The endoscopy group was **significantly faster than the control group** at accessing the peritoneal cavity through the gastric incision, applying diathermy to the base of the appendix, and navigating to the gallbladder. Endoscopy participants **completed the full NOTES procedure in a shorter time** than the laparoscopy group. The study highlights the importance of endoscopic training for simulated NOTES task that involves both navigation and resection with operative maneuvers. Although laparoscopic training confers some benefit for operative steps such as applying diathermy to the gallbladder fossa, it wasn't beneficial as training endoscopy

## **Abstract 6: Differences between Box trainers and Virtual Reality based simulation**

Residents trained on VR, without prior training, shortened operational time, decreased errors and increased accuracy when compared to traditional training. For residents with limited laparoscopic experience, **VR training shortened operational time, increased accuracy and reduced redundant movements.** For the abovementioned group, the Composite Operative Performance was superior in the VR group compared to the box trainer group

Sutherland et al. Surgical simulation: a systematic review. Ann Surg. 2006

Gurusamy et al. Virtual reality training for surgical trainees in laparoscopic surgery. Cochrane Database Syst Rev 20091



# Simulation's Financial Benefits

**Simulators can be expensive! But lack of knowledge/skills can be far more expensive!**

Economical models demonstrate that the use of **simulators reduces costs to the hospital by increasing efficiency and productivity** of the OR team. Simulators can **reduce procedural complications and the costs associated with them and increase patient satisfaction.**

**Abstract 1: Cost savings from reduced catheter-related bloodstream infection after simulation-based education for residents in a medical intensive care unit.** Cohen ER et al. SimuHealth 2010. **Annual estimated savings were approximately \$820,000, 139 patient hospital days, and 120 MICU days.** When compared with the cost of our intervention (\$112,000), the net savings was approximately \$708,000 (a 7:1 rate of ROI), thus **SBME was highly cost-effective and results suggesting that investment in simulation training can produce significant medical care cost savings.**

**Abstract 2: Effect of virtual reality training on laparoscopic surgery: randomised controlled trial.** Orzech et al. A comparison of 2 ex vivo training curricula for advanced laparoscopic skills: a randomized controlled trial. Ann Surg 2012. **VR training was more efficient than box training (transfer effectiveness ratio of 2.31 vs 1.13),** demonstrating better suturing efficiency and effective movements. Annual cost of training 5 residents on the FLS trainer box was \$11,975, on the VR simulator was \$77,500, and conventional residency training was \$17,380.00. **VR training was more cost-effective, significantly decreased laparoscopic suturing learning curve and was a more efficient training modality.**

**Abstract 3: Initial laparoscopic basic skills training shortens the learning curve of laparoscopic suturing and is cost-effective.** Stefanidis et al. J Am Coll Surg 2010. The performance on the simulator was better for Group I after basic skills training, and their **suturing learning curve was shorter** compared with Group II. Additionally, Group I **required less active instruction.** Time required to finish the curriculum was similar for both groups; but Group I training strategy cost less, with a savings of \$148 per trainee. **Teaching novices basic laparoscopic skills before a more complex laparoscopic task produces substantial cost savings.**

# Simulation & Insurance Costs

In Massachusetts physicians need to mark in their medical license applications whether they have gone through simulation training.

Insurance companies **reduce 5% premium** for physicians that participate in simulation training at Harvard affiliated hospitals.

**ACS has begun discussing with health insurance providers to create simulation based annual training package, that its participants will benefit of premium reduction.**

The Winter Institute for Simulation, Education, and Research (WISER) of the University of Pittsburgh, together with the UPMC Health System both have their own insurance company.

"If that's not convincing, how about a discount on physicians' liability insurance? With simulation training among other points on a résumé, CRICO Risk Management Foundation, which insures Harvard medical affiliates, **has knocked off 10 percent from obstetricians' \$61,130 annual insurance bill**; anesthesiologists with simulation training are allowed a 5 percent discount. Other insurers are following suit."






# Ready-To-Use Curricula

Validated Simulator-Based Training Program

# Ready-to-Use Curricula

## 17 Courses Available Already for GI, BRONCH, LAP, URO-PERC

Simbionix in collaboration with key leaders in medical education provide our worldwide customers with well thought out curricula.

-  Ready-to-use or can serve as a **template for program directors**.
-  **Video-based education** accompanies **hands-on training**.
-  Additional **videos can be easily added** at the institution.
-  Reading material - **Links to AccessSurgery content**.
-  **Goal-oriented skills training** - following **expert-derived performance goals**.

The ready-to-use curricula are provided via MentorLearn™, at no cost, to both online and offline customers, however using [MentorLearn Online](#) provides the advantage of remote access to learning and didactic materials offsite.

# Collaboration with Leading Societies



SAGES: endoscopic hands-on skills assessment system for their Fundamentals of Endoscopic Surgery (FES) program



European Association for Endoscopic Surgery (EAES): training materials and assessment tools for the Laparoscopic Skills Curriculum



American Association for Bronchology and Interventional Pulmonology (AABIP): bronchoscopic skill tasks module 'Essential Bronchoscopy'



American College of CHEST Physicians (ACCP): co-develop training modules and tools to improve patient safety through medical education



# Medical Training Regulatory Bodies & The Future of Medical Training

## !Striving for Standardization

# Mandatory Simulation Training

- .Aviation
- .Mining
- .Rail
- .Shipping
- .Military



# Medical Training Regulatory Bodies

## Regulation and accreditation agencies begin to support the use of medical simulators for training

**ACGME** – The Accreditation Council for Graduate Medical Education (ACGME), the body that accredits (and audits) residency and fellowship programs in the USA. Starting July 2014, ALL residents/fellows programs in the US will have to provide skills labs for their trainees. This is quite important and creates a lot of simulation/curriculum activities;:

- **Surgery residency programs** – simulation is mandatory, all residents programs must have simulation centers
- **Internal Medicine residency programs** - have to provide simulators access to their residents/fellows
- **Interventional Cardiology programs** - have to include simulation based training
- **Neuroradiology fellows programs** - must demonstrate safe methods of training and the use of simulators
- **Electrophysiology fellows programs** have to include simulators (as of July 2012).
- **Orthopedic Surgeons** have to provide skills labs (July 2013)

## BOARDS

- **ABMS - American Board of Medical Specialties** - The body that tests and certified all physicians in the USA. It includes 24 Boards from different disciplines. Its guidelines are to incorporate medical simulators into training for MOC (maintenance of certification).

**ABS - American Board of Surgery** – with the ACS and with SAGES include the FLS and FES in the certification.

**ABIM - American Board of Internal Medicine** - along with the ACC (American College for Cardiologists) and SCAI (Society for Cardiovascular Angiography and Interventions) is actively looking to integrate simulation into programs.

**ABOS - American Board of Orthopedic Surgeons** and **RRC (Residency Review Committee)** requires skills lab starting July 2013

# Medical Training Regulatory Bodies

- **American College of Surgeons (ACS)** created an international program of accreditation of simulation centers (over 70 accredited centers globally from the USA, Canada, UK, Sweden, France, Greece, China (West China Clinical Skills Training Center in Chengdu <http://hxcstc.lab.scu.edu.cn/>) and Israel). These centers must be recertified every 3 years by demonstrating they are active and updated.
  1. Active with medical schools' curriculum, designed ACS prep course, ACS simulation based surgical skills course. Both will be mandatory before starting residency program beginning summer 2014.
  2. Initiated talks with insurance companies to design training packages that will reduce insurance premiums.
  3. Will start to include simulation based procedures curriculum and collaborate with industry to lead SBME
  4. Designing new curriculum for residents and fellows with simulation.
  5. More than 70 simulation centers have been already accredited as ACS Accredited Education Institutes level I or level II (the level I or level II is determined by the number and kind of simulation equipment and by the number of courses/activities that are offered)

**European Association for Endoscopic Surgery (EAES)** has an exclusive agreement to collaborate on the development of training materials and assessment tools for the Laparoscopic Skills Curriculum. The Laparoscopic Skills Curriculum includes both didactic and skills development components, including eLearning and simulation-based assessment elements.

**The Society of American Gastrointestinal Endoscopic Surgeons (SAGES)** initiated FES and FLS programs. Works closely with Simbionix to develop and validate the GI Mentor FES training and testing module. VR FLS provides automatization of metrics.

# Medical Training Regulatory Bodies

**AAGL** (American Association of Gynecologic Laparoscopists) – recommends to its members the use of simulators, established simulation committee to develop simulator based curriculum

**IMSH** (International Meeting on Simulation in Healthcare) and **SSH** (Society for Simulation in Healthcare) - initiates their own simulation centers accreditation program, 45 centers are accredited, does not focus on content

**AAOS** (American Academy of Orthopedic Surgeons) and **AANA** (Arthroscopy Association of North America) have dedicated active committees to integrate the use of simulation. Created the **FAST (Fundamental of Arthroscopy Surgery Training) program**

**MIRA** (Minimally Invasive Robotic Association ) in the process of identifying required basic skills and using simulation for training and assessment

**ASSET** Alliance of all surgical associations (multidisciplinary). A multidisciplinary organization whose goal is to promote simulation based curricula. It is planned to be under the umbrella of the ACS

**:FRS** (Fundamental of Robotic Surgery, Satava's project)

The validation will begin on Oct 2013. Intuitive Surgical is involved in the process

The assessment will be done on a physical model, couple of tasks similar to the FLS, but the training will be done on the simulated tasks

**CMSS** - Council of Medical Specialty Societies - a forum that represents all medical specialties, initiates simulation summits to find ways to move forward with integration of simulators into training and certification

**FDA encourages the use of simulation for training as part of introducing new medical device to the market**

# Medical Training Regulatory Bodies

**CMS (Center for Medical Simulation, Cambridge, Mass.)** CMS is an educational organization dedicated to improving the quality of health care through teaching team work and clinical decision-making using simulation. CMS has special programs for Medical Device and Pharmaceutical Company personnel. **All programs make extensive use of full-scale simulation systems, computer simulations, and partial-task trainers.** Currently, all Anesthesia faculty participate in simulation-based training and **receive .malpractice insurance discounts**

[http://www.cumc.columbia.edu/dept/fischbach/lectures/strategic\\_plan\\_II/simulation\\_resource\\_document.html](http://www.cumc.columbia.edu/dept/fischbach/lectures/strategic_plan_II/simulation_resource_document.html)

**ACOG (The American College of Obstetricians and Gynecologists).** The ACOG Consortium **created a simulation-based tool kit for their members with a detailed curriculum.** ACOG Committee on Ethics (August 2011): “Improvements in technology continue to allow for increased training in the virtual setting for learners. Specifically, **technology has allowed surgical training using laparoscopic and hysteroscopic surgery simulation and has improved resident education** in these areas. Obstetric simulators also have allowed for teaching emergency techniques, maneuvers, and management .”strategies without putting patient safety at risk

# Mandatory Simulation Training

**ACGME** – To achieve accreditation OUS, institutions/programs must jointly ensure the availability of adequate resources for resident education, as defined in the advanced specialty program requirements. Resources should include simulation and skills laboratories.

**The European Working Time Directive (also implemented in GB law)** has put pressure on surgical training programs that VR simulators can contribute to the training of core skills in laparoscopy. **High grade evidence (grade IA – IIB) is available on the effect of VR simulator training on real operations.**

**Singapore** – ACGME requirements + residents should perform at least 10 vaginal deliveries and 10 lumbar punctures, up to 5 of each may be done on a simulator.

**UK – The Joint Committee on Surgical Training (JCST)** in the UK has agreed to integrate simulation into the Intercollegiate Surgical Curriculum Project (ISCP).

The UK is working on a national simulation based certification program for interventional radiologists

**The Netherlands** - DHI (Dutch Healthcare Inspectorate) is requiring establishment of pan-disciplinary agreements with regard to training and skills assessment in endoscopic surgery and the introduction of a quality assurance method (certification) covering endoscopic skills.

1. In all programs, simulation-based training to a certain level of competence is stated to be mandatory before the trainee can start MIS on patients as a first operator.

# Simulators-of-Choice at Training Centers & Industry

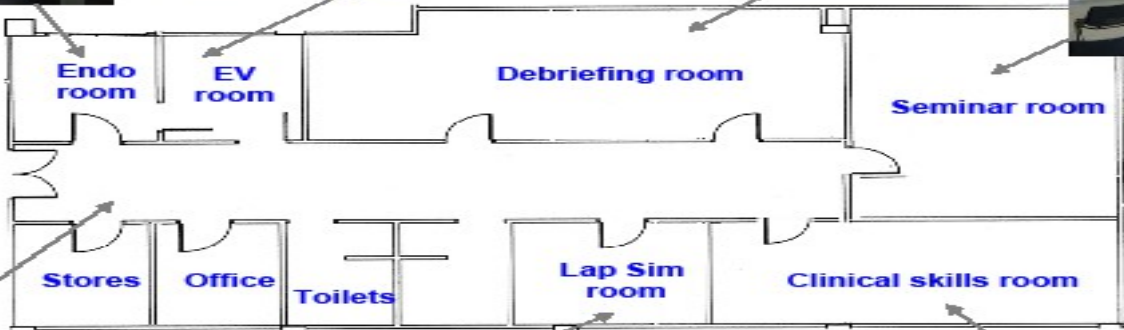


# Medical Training Center – An Important Ingredient

The training center is at the core of the future delivery of medical education and training:

- Provides access to advanced training technologies.
- Develops training courses focused on areas of need.
- Provides an immersive environment to emulate clinical settings.
- Deploys a standardized approach to training.
- Collaborates with other training centers and institutions nationally and internationally.

# LAP Mentor™ Simulator-of-Choice of Training Centers Globally



Royal Free Clinical Skills Centre



# Royal Free Medical Simulation Centre



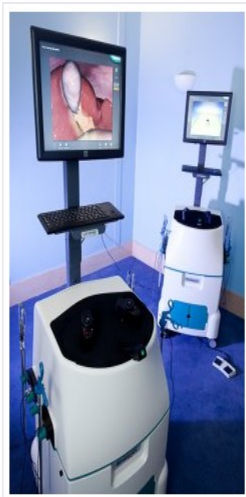
LAP Mentor™

## The LAP Mentor™ Simulator

The Lap Mentor™ (Simbionix, USA) is a laparoscopic simulator providing cutting edge training solution for laparoscopic surgery to learners of all levels.

The simulator offers a multidisciplinary curriculum covering a spectrum from essential skills, suturing and procedural tasks to simulation of full procedures such as cholecystectomy, hernia repair, gastric bypass, sigmoidectomy, salpingo-oophorectomy and others.

[BOOK SIMULATOR NOW](#)



[BOOK A COURSE  
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### Upcoming Courses

- FY2 Clinical Skills Teaching
- London Deanery - Gastroenterology Teaching Day

[SEE MORE](#)

Royal Free Hampstead 



# LAP Mentor™ Integrated into Laparoscopic Training Courses in Leading Training Centers

SCREEN-BASED MEDICAL SIMULATION CENTRE  
ROYAL FREE HAMPSTEAD NHS TRUST



## LAPAROSCOPIC SUTURING COURSE

16 March 2009  
15 June 2009  
14 September 2009  
7 December 2009

### SUITABLE FOR:

General surgery, gynaecology and urology

### AIM:

This course is aimed at surgeons who regularly perform laparoscopic procedures but would like to develop competence in laparoscopic suturing techniques. The course familiarises delegates with basic suturing techniques and allows progression to advanced techniques.

### FACULTY:

Mr Bimbi Fernando (consultant surgeon)  
Mr Peter Veitch (consultant surgeon)  
Mr Zac Rahman (consultant surgeon)  
Dr Pasquale Berlingieri (research fellow)

**FEES:**  
£400.00

**VENUE:**  
Screen-Based Medical Simulation Centre  
Royal Free Hampstead NHS Trust  
Pond Street  
London NW3 2QG

**CONTACT:**  
Dr Pasquale Berlingieri  
(e-mail: [p.berlingieri@medsch.ucl.ac.uk](mailto:p.berlingieri@medsch.ucl.ac.uk))

## Customers Take Pride in Providing Simbionix State-of-the-Art Simulators

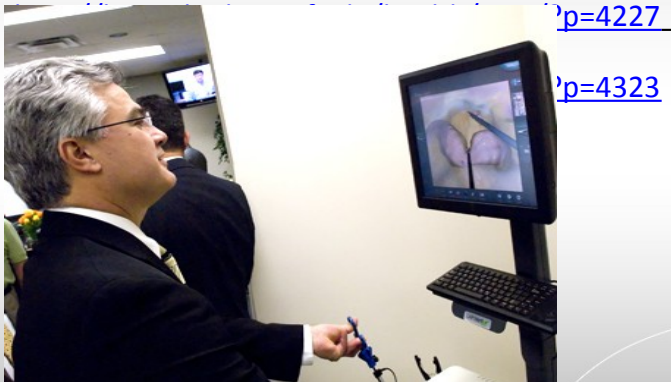


# LAP Mentor™ Simulator-of-Choice of Training Centers Globally

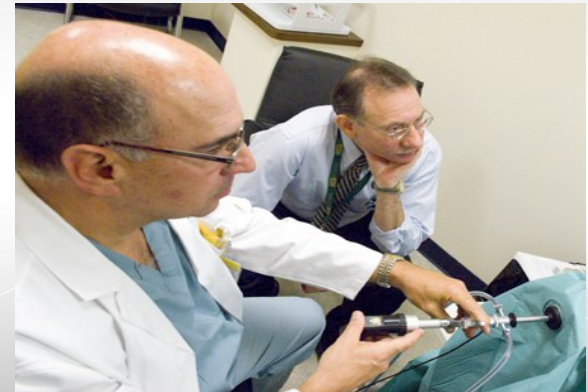
## [USF Health Simulation Center Opening – from the Web](#)

*“The center houses more than \$600,000 worth of **virtual-reality simulators** that mimic the look and feel of actual endovascular and **surgical procedures** such as cardiac catheterizations, **laparoscopic hernia repairs**, laparoscopic hysterectomies or colonoscopies. ..”*

*“With this new center, **USF Health is truly at the forefront** of the evolution in clinical and surgical training,” said Stephen K. Klasko, MD, MBA, CEO for USF Health and dean of the College of Medicine. “In partnership with Tampa General Hospital and **several of the world’s leading innovators of advanced simulation technology**, we have created a center that emphasizes **patient safety, reducing medical errors and improving efficiency**. All this is directed toward achieving our ultimate goal – **better patient care.**”*



Dr. Jorge Marcet, director of the Division of Colon & Rectal Surgery, takes the controls of the Lap Mentor simulator used for hands-on practice of laparoscopic surgical procedures.



Dr. Larry Glazerman (left), director of Minimally Invasive Gynecological Surgery, demonstrates the hysteroscopy simulator to Dr. Fred Slone, medical director of the Center for Advanced Clinical Learning

# Simulator-of-Choice at Training Centers Worldwide

The Symbionix LAP Mentor has become the simulator-of-choice at training centers worldwide, and is integrated into laparoscopic training courses in leading training centers.

## University of Nevada Surgical Simulation and Skills Lab

*“LAP Mentor has become a consistent teaching tool at our institution and we hope to further grow with LAP Mentor as it continues to grow.”*

Adnan Mohsin, Skills Lab Coordinator.



**Dr. Larry Glazerman, left, and Dr. Stuart Hart, USF Health Simulation Center at Tampa General Hospital**

## ETHICON Products Professional Education Division

*“The simulator project was a big success and our young residents were very enthusiastic to train. The experienced surgeons who wanted to test the system had no chance to access the simulator because it was booked every day for more than 10 hours, even on the weekends.”*

Dr. Toomas Ümarik and Dr. Martina Vitz, Laparoscopic Training Center, Switzerland.

# LAP Mentor™ Simulator-of-Choice of Training Centers Globally

## Malcom Randall Veterans Affairs Medical Center

*“A new high-tech laparoscopic surgical simulator at the Malcom Randall Veterans Affairs Medical Center will not only help train University of Florida College of Medicine surgical residents, it **will contribute to improved patient care and safety...***

*Because of the complex nature of laparoscopic surgery, it is difficult to watch operations and learn. That’s why simulating hands-on practice has become such a useful training tool...*

*This system incorporates a **variety of practice opportunities**, and provides a **laparoscopic training curriculum** made up of basic skills, tutorials of procedural tasks, and simulation of a full procedure, said Dr Ben-David (lab director)...*

*It is this **tactile experience** that **differentiates the new simulator** from current simulators in the lab. Dr Ben-David said the other simulators are very helpful in teaching surgical residents how to work with the laparoscopic tools to become more proficient with the minimally invasive style of surgery. The **LAP Mentor** simulator provides **resistance feedback via the surgical tools**, providing a **realistic feel of what each step would feel like as it is completed during surgery...**”*

<http://news.medinfo.ufl.edu/articles/miscellaneous/new-surgical-simulator-provides-true-%E2%80%98feel%E2%80%99-of-surgery/>



PGY4 Surgical residents work together on the LAP Mentor surgical simulator at the Malcom Randall Veterans Affairs Medical Center.

# LAP Mentor™ Simulator-of-Choice of Training Centers Globally

## Advanced Surgery Training Centre (ASTC <http://www.astc.sg>)

The Minimally Invasive Surgical Center (MISC) offers the **latest in medical simulation technology**. MISC provides **training and curricula to residents and surgeons across fields** (General surgery, urology, gynecology, colorectal, etc) interested in learning laparoscopic surgery. [www.misc-asia.com](http://www.misc-asia.com)

*“The Symbionix LAP Mentor simulators are utilized during all workshops and training sessions involving laparoscopic surgery as an integral part. The center and its users benefit from the LAP Mentor’s Great efficacy, Performance monitor, Safety and objective teaching, Validating courses”*

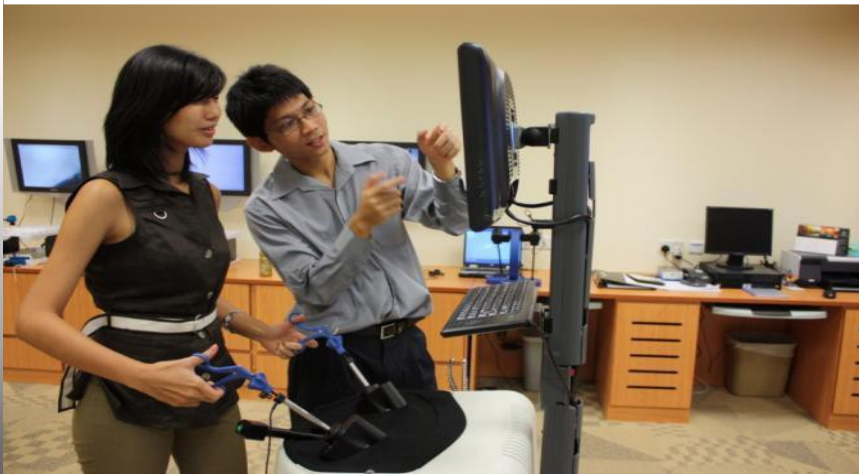
Davide LOMANTO, MD, PhD, FAMS (Surg)

Assoc Professor and Senior Consultant Surgeon

Department of Surgery, Director MISC, Director,

ASTC

National University Hospital, Singapore



# LAP Mentor™ Simulator-of-Choice of Training Centers Globally Mt. Sinai Skills and Simulation Center

*“LAP Mentor™ is a multi-disciplinary surgery simulator that enables simultaneous hands-on practice for a single trainee or a team. New or experienced surgeons can practice everything from perfecting basic laparoscopic skills to performing complete laparoscopic surgical procedures.”*

*Mt Sinai Foundation Newsletter Spring 2009*





# LAP Mentor™ Simulator-of-Choice of the Industry Johnson & Johnson

Proudly offering advanced virtual reality simulators for professional education

J&J ProfEd Newsletter →





## EMEA

### Professional Education Bulletin

30.8. 2008






**IN THIS ISSUE**

**EDITORIAL**

Dear all,  
I hope that most of you had the opportunity to enjoy a few days of vacation during this and last month, and re-charged yourselves in preparation for the upcoming hectic fall period.  
After a pause, we are bringing you a new „summer“ issue of our bulletin, in which we again turn your attention to the latest updates in EMEA ETHICON Professional Education programs. Read about a new curriculum of our lap trainings, opening of a new EMEA center of excellence in Rome, launch of an exciting new MIS training program on 2 new LAP MENTOR simulators, and much more.

Happy reading, your Prof. Ed. team.

**COMING UP NEXT MONTH**

- 5 Professional Education courses
- Mesh Brand Team Meeting 10-11.9. - Brussels
- Suture Brand Team Meeting, 15-18.9. - Lisbon
- Promotional videos for UHS™ and LAP solutions courses in Bonheiden
- More information about simulator rentals
- Course calendar for 2009

**CALENDAR**

**SEPTEMBER PROFED COURSES**

2-3rd UHS™ course in Bonheiden  
9-10th UHS™ course in Bonheiden  
11-12th OIHR in Aschen  
22-24th LAP Solutions course in Bonheiden  
25-26th Masters LIHR in Hamburg

**DASHBOARD**

**08 PROF. ED. DASHBOARD**

CLINICAL TRAINING	
Stomach hernia repair	10
Open incision hernia repair	20
Open day: laparoscopic repair	17
Virtual local events	12.11
<b>TOTAL clinical</b>	<b>1445</b>
NON-CLINICAL TRAINING	
Planning managers training	15
Team trainer	0
Quality and innovation	3
<b>TOTAL non clinical</b>	<b>28</b>

**CONTACT US**

[mkousskov@ethicon.com](mailto:mkousskov@ethicon.com)

**TWO NEW LAP MENTOR VIRTUAL REALITY SIMULATORS NOW AVAILABLE IN EMEA PROFESSIONAL EDUCATION**



EMEA Professional Education has acquired two portable LAP MENTOR simulator units, one of which you had a chance to see and evaluate in Athens during the marketing week in April. Both simulators are now available in EMEA Professional Education for use in your local surgeons' laparoscopic training programs.

**NEW CONCEPT OF LAPAROSCOPIC TRAININGS FOR THE HERNIA PLATFORM**

Based on the feedback from various discussion we held with most of you and with our European faculty during the last couple of months, we have reviewed the current concept of laparoscopic trainings, and we are now proud to introduce a completely new curriculum for MIS trainings for the hernia platform.

**TAILORED APPROACH TO INGUINAL HERNIA REPAIR - NEW PROFESSIONAL EDUCATION COURSE/CENTRE OF EXCELLENCE- ROME, ITALY**

We are happy to introduce to you a new Professional Education program on Inguinal hernia repair focused on use of LWPAM /UHS,UPP/ in Day Surgery. The

(ESI)

# ANGIO Mentor™ Simulator-of-Choice of the Industry

## Boston Scientific – Institute for Therapy Advancement (Paris)

“For the past few years we have been using the ANGIO Mentor in our Cardiac Rhythm Management, Peripheral Interventional / Embolization, Interventional Cardiology and Neurovascular courses at the Institute for Therapy Advancement training center. Our goal is to train physicians, nurses and technicians in a safe environment, on how to perform a full procedure and manage complications before they happen in real life situations.”

Nathalie Capes, Training Technology Specialist, Institute for Therapy Advancement, Boston Scientific



**Boston Scientific, Institute for Therapy Advancement**

# SBME adoption by Professional Societies



Society of Vascular Surgery Workshop, USA



British Society Interventional Radiology  
Training, UK

Medical societies are starting to utilize high fidelity simulators for their **accreditation** and **assessment**

## Conclusion

*Healthcare simulation is a range of activities that share a broad, similar purpose,  
To improve the safety, effectiveness, and efficiency of healthcare services.*



*That's why... (simulation)*



**THANK YOU**

