



# E-Learning in Medical Education

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# Agenda

- Evolution of e-learning
- What is e-learning
- why e-learning in Medical education (needs and advantages)
- Users
- Pre clinical, clinical, CME
- Trends and strategies
- Mods of e-learning (online)
- goals of medical education
- Challenges of medical education
- Blended learning
- Conclusions

# Evolution of E-Learning

- It is believed that there has not been any significant changes in the education sector for long time. There have been tweaks here and there but, by and large, as a sector it has been slow to change and, indeed, resistant to change
- The Internet, has radically & dramatically changed the way that we access information. In addition, emerging teaching methodologies with the power of information and communication technologies (ICT) have brought a dramatic change in the educational strategies
- Student is becoming the key focus (Learner-centricity) of the educational process, in educational organizations, learning management systems, and E-Learning, etc.
- Teaching, meanwhile, is becoming a peripheral activity





# Evolution of E-Learning

- Recently, though there have been indications of a major shift, and two factors might be advanced to explain this; first the changing cultural and economic landscape that has forced universities to become more stakeholder and market-oriented; and second, what might be described as the “eruptive technology” of e-learning (Hart & Christensen, 2002)
- E-learning, can be defined as the use of information and communication technologies or the Internet in educational activities. E-learning is also defined as learning mediated by technology, such as the Intranet, and multi-media based computer applications.
- In medical education, e-learning systems require special design because of the nature of medical education which requires more practical sessions, and more student involvement in medical procedures and operations



# Changing Trends in Elements of Education

- Educational Strategies
- Technologies & Tools
- Content
- Environment and Culture
  - Distance Learning
  - Online (internet)
  - Self Paced
  - Integrated (blended)



# Educational Strategies

Based upon the changes that brought the transformation of educational process.

## Before

**Student was passive**

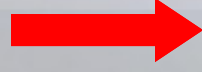
**Teacher centered or material based**

**Monotonous subject delivery**

**Student dependent on teacher**

**Student creativity not recognized**

**Student knowledge receiver**



## Now

**Student now active**

**Student centered**


**Multitonus subject delivery**

**Student self dependent**

**Student creativity key focus**

**Student knowledge hunter**

# E-Learning Modes



	Text-based	Multimedia
Synchronous	IRC, discussion forums, chatting	Video conferencing
Asynchronous	Email, Computer conferencing	Voicemail, Videograms, Video on demand



# Needs that brought the change

- Teacher – Students ratio not acceptable
- Students out of focus during lecture
- Student subject absorption not evaluated
- Subject delivered is not frequently demonstrated for practicality
- Limitations for Student Creative thinking





# E-Learning in Medical Education


- The practical and sensitive nature of medical education increases the importance of E-Learning.
- E-Learning can be used in teaching basic sciences, pre-clinical, and clinical subjects.
- Practical subjects like anatomy, and clinical training require high level of interaction to enable student to get the most out of it.

# Introduction

- **Medical schools employ a variety of strategies for teaching, ranging from lecture-based one-way transmission of information to interactive Socratic method of instruction.**
- **In traditional education the lecture is held at a specific time and location. If it is not possible for the learner to attend the lecture, or if the location is difficult or expensive to reach, the potential experience may be lost.**



# Goals of Medical Education

- 
- **Developing strong skills**
  - **Mastering core content**
  - **Thinking critically and creatively**
  - **Working collaboratively**
  - **Using appropriate problem-solving strategies**
  - **Functioning as part of a global community**
  - **Making commitments to lifelong learning**



# Challenges Facing Medical Education

- Rising student numbers and demand
- Rising costs
- Reduced funding
- Geographical dispersal
- Increased competition in a complex market
- Fast evolvment in medicine and education





# Advantages of Using Computer Supported Tools

- ✓ **Interactivity**
- ✓ **Self-directed learning**
- ✓ **Multimedia**
- ✓ **Information retrieval**
- ✓ **Access**
- ✓ **Group Benefits**
- ✓ **Cost**

# Elearning Users

- Students:
  - Preclinical Applications
  - Clinical Applications
- Professionals:
  - Physicians
  - Healthcare staff
- Healthcare Consumers

# Clinical Teaching

- **Diagnostic problems**
- **Simulated patients**
- **Decision making**
- **Clinical cases**



# Examples of CME providers and organizations

Accreditation Council for Continuing Medical Education (ACCME)	<a href="http://www.accme.org">http://www.accme.org</a>
WebMD	<a href="http://www.webmd.org/">http://www.webmd.org/</a>
CMEWeb	<a href="http://www.cmeweb.com/">http://www.cmeweb.com/</a>
CME courses	<a href="http://www.cmecourses.com/">http://www.cmecourses.com/</a>
Current CME Reviews	<a href="http://www.cme-reviews.com/">http://www.cme-reviews.com/</a>
CME-WebCredits	<a href="http://www.cme-webcredits.org/main_CmeCourses.html">http://www.cme-webcredits.org/main_CmeCourses.html</a>
Cyberounds	<a href="http://www.cyberounds.com">http://www.cyberounds.com</a>
Medscape	<a href="http://www.medscape.com">http://www.medscape.com</a>
Medical Matrix	<a href="http://www.medmatrix.org/">http://www.medmatrix.org/</a>





# Consumer Health Education

- Patients may use the Internet to join disease or symptom-focused chat groups or to search for information about their own conditions
- Information about medications, illnesses, and symptoms are easily available

The “old” way

The “new” way

Phospholipid bilayer

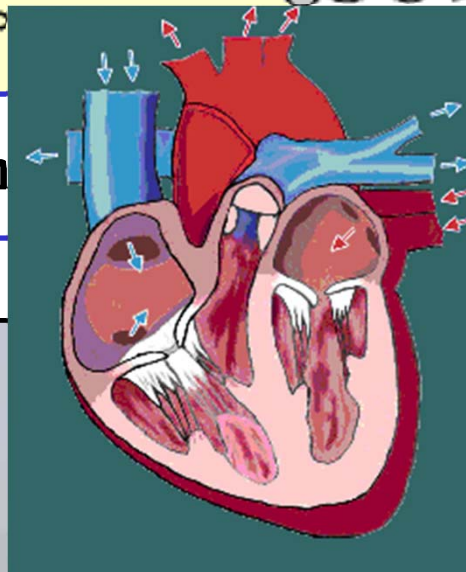
CYTOSOL

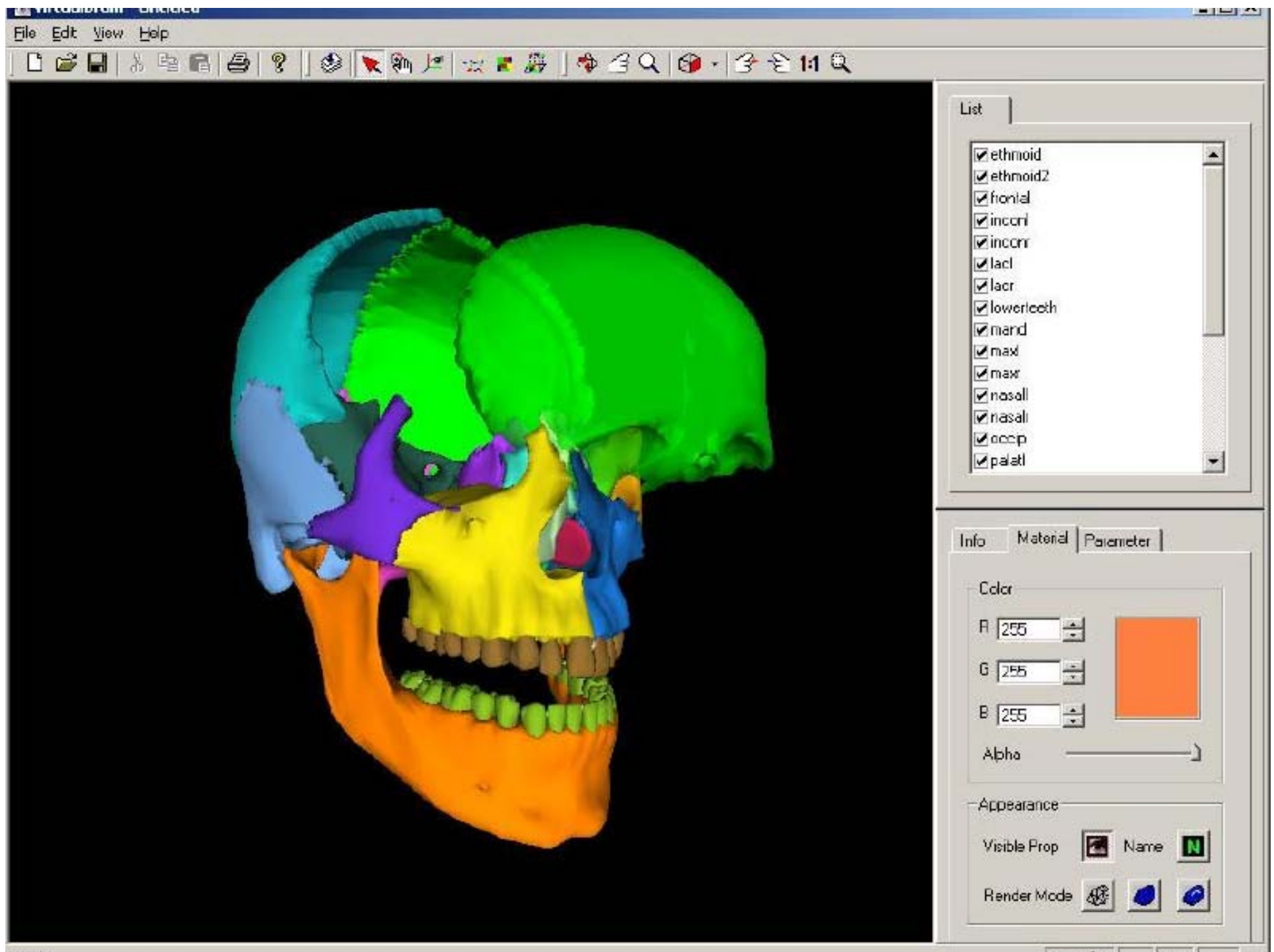
EXTRACELLULAR FLUID

The cycle begins.

Legible graph

Video and interactivity

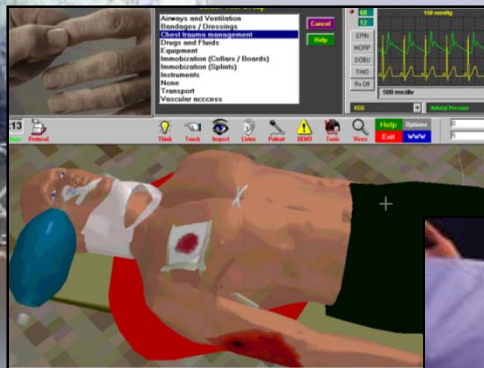




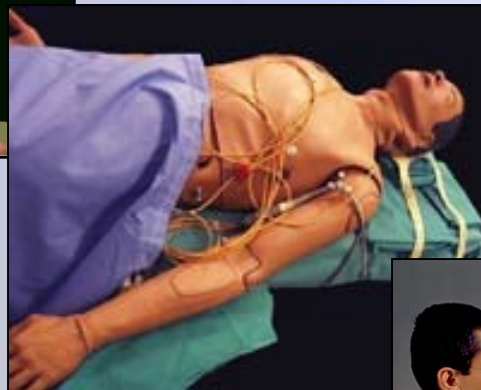


# MULTIPLE TECHNOLOGIES

TO MEET MULTIPLE TRAINING NEEDS



**PC-based Interactive VR/Multimedia**



**Digitally Enhanced  
Mannequins**

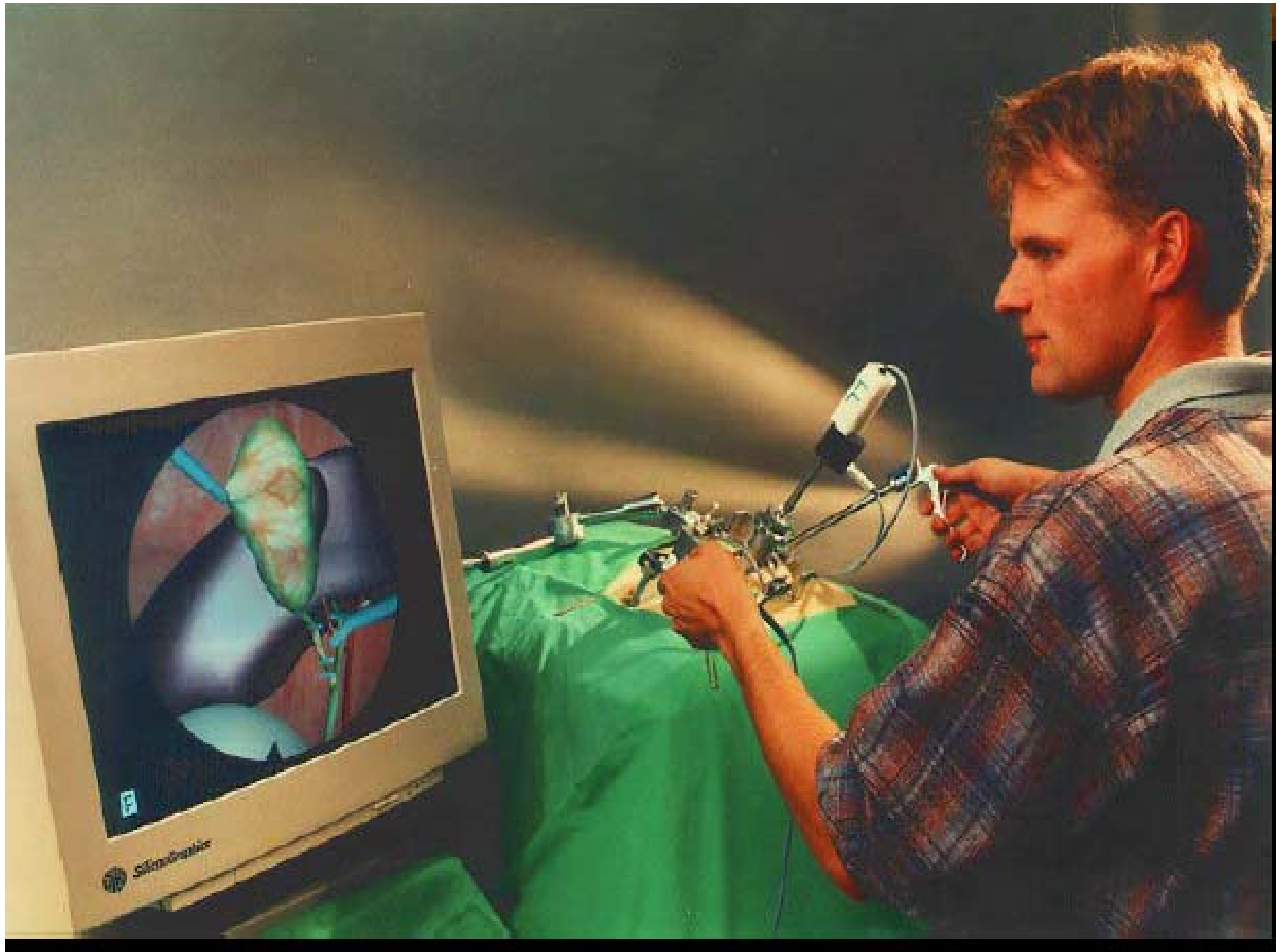


**Virtual  
Workbenches**



**Total Immersion Virtual Reality**





Anesoft ACLS Simulator - Case 2: V Fib arrest

File Airway Breathing Circulation Defib/Differential Help



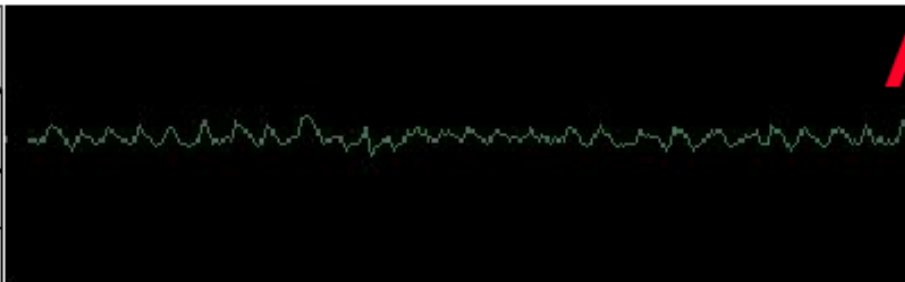
**Defibrillator**

Energy  Joules

☐ Sync

00:00:57

HR: 0



**ACLS Simulator**

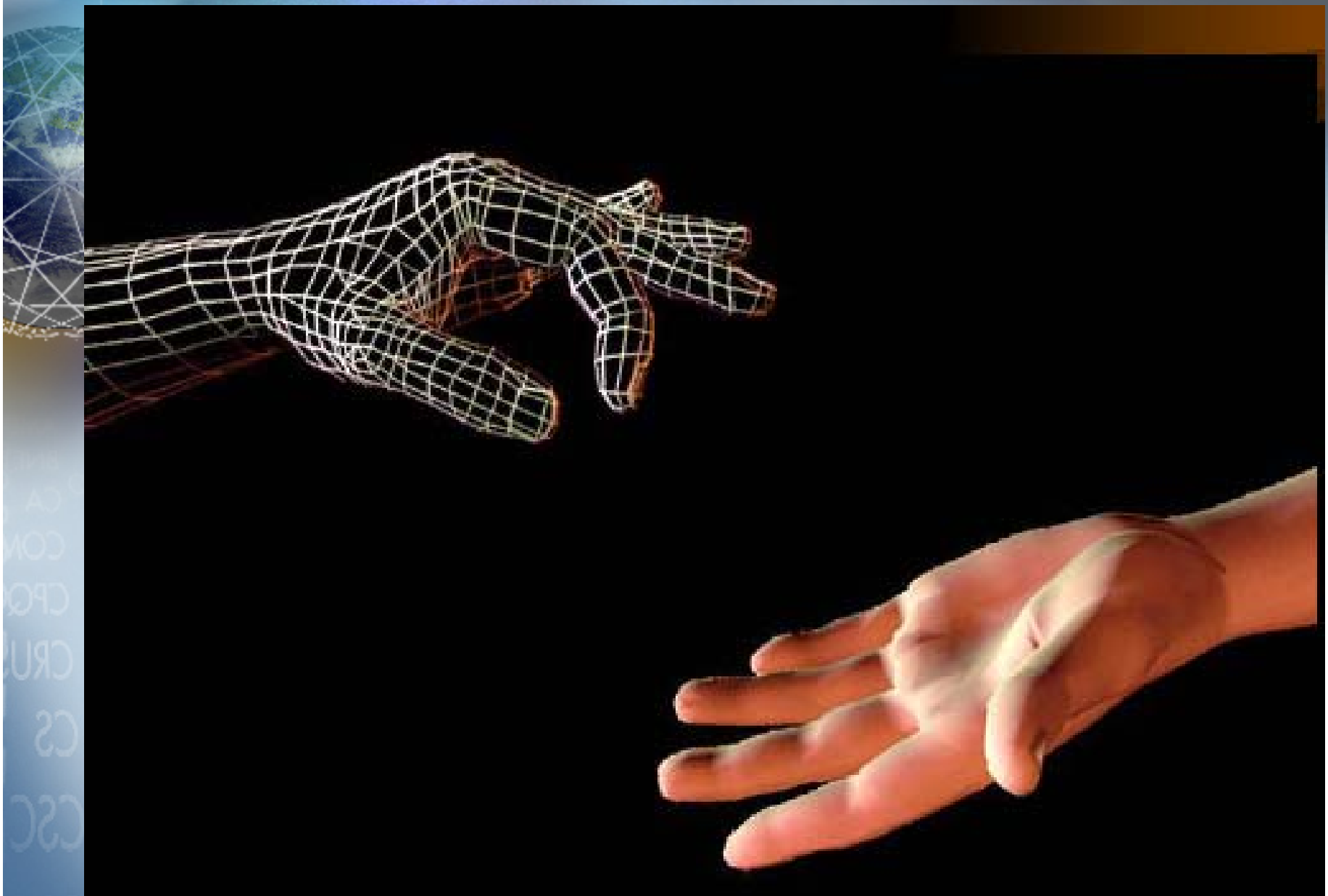








**Online demonstration to the eCurriculum**  
**[http://www.med.uottawa.ca/medweb/demo\\_site/](http://www.med.uottawa.ca/medweb/demo_site/)**





# Blended learning

- 
- Using E-Learning systems in conjunction with traditional learning (blended or integrated learning)
  - One of the major advantages of blended learning is to expand the resources available for students, and help them focus on their learning objectives



# Integrating different hospitals and learning systems

- One of the advantages of blended learning in Medicine is to utilize existing hospital systems and resources to enhance the learning process
- Pictures from radiology department, videos from operation rooms accompanied by explanation from doctors, and patient history and records are made available to students
- These systems help to increase students' capability to diagnose cases, and understand difficult surgeries

# IN CONCLUSION

- E-learning is used to augment and enhance traditional teaching strategies:
  - improve learning
  - provide new methods of learning
- Learning more exciting, effective, and likely to be retained by combining conventionally taught components with the use of up to date multimedia resources, including books, course guides, videotapes, television, E-Conferencing, & discussion groups.

“e-Learning aims to complement, enhance, BUT replace traditional learning”