

BETH ISRAEL DEACONESS MEDICAL CENTER

Profile

- Boston, MA
- www.bidmc.harvard.edu
- Teaching hospital, Harvard Medical School affiliate

Key Priorities

- Enhanced training
- Accelerated learning
- Patient safety

Simulators and Modules Used

- Endoscopy AccuTouch System
 - Introduction to Bronchoscopy
 - Transbronchial Needle Aspiration
 - Pediatric Difficult Airways
 - Bronchoalveolar Lavage and Endobronchial Sampling

Key Benefits of System

- Faster learning
- Realistic experiences
- Increased student satisfaction
- No-risk training
- Improved patient safety
- Qualification tool for clinical procedures



Users learn proper tool handling, which can help reduce equipment maintenance costs in real-procedure settings.

Safe, Efficient, Effective Training of Bronchoscopies

“Using the AccuTouch simulator, people are now better trained in endoscopy. And something you probably can’t put a measure on but that I believe to be the case, patient safety is better. And, the satisfaction of the trainees seems improved.”

—Dr. Armin Ernst, Assistant Professor of Medicine, Harvard Medical School, Beth Israel Deaconess Medical Center



**Beth Israel Deaconess
Medical Center**



Harvard
Medical School
Teaching Affiliate

Endoscopy Accutouch® System **SUCCESS STORY**



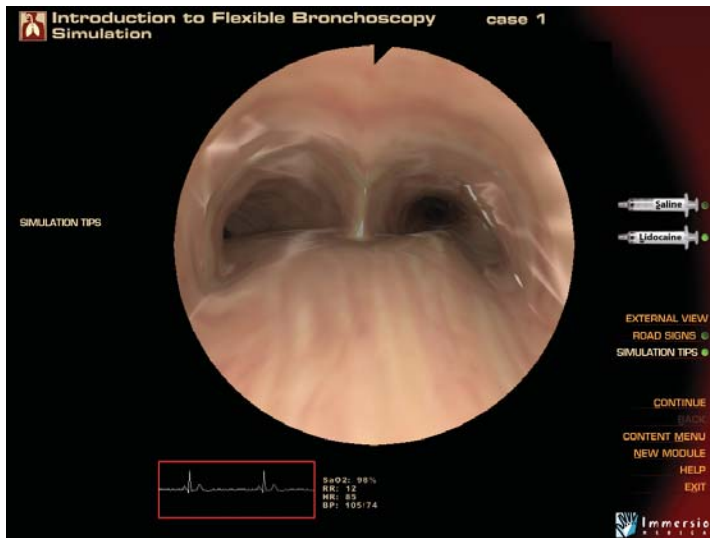
Endoscopy AccuTouch System

A realistic, computer-based system for teaching and assessing motor skills and cognitive knowledge of flexible bronchoscopy and upper and lower gastrointestinal flexible endoscopy. Real-time computer graphics include anatomic models developed from actual patient data. Force feedback is transmitted through the flexible scope to provide tactile sensations mimicking the actual feel of a procedure.

History of Excellence

Decades before Beth Israel and New England Deaconess hospitals came together as Beth Israel Deaconess Medical Center (BIDMC), each was a leader in health care. The history of the medical center shows a tradition of excellence with many medical milestones to its credit: The first implantable cardiac pacemaker was developed at Beth Israel Hospital in 1960. The first baby conceived through in vitro fertilization in Massachusetts was delivered at Beth Israel Hospital in 1986. New England's first minimally invasive coronary bypass surgery was performed at New England Deaconess Hospital in 1995. And in keeping with this tradition, BIDMC contributed to the development of Immersion Medical's AccuTouch Endoscopy Simulator, and acquired its own model in 1998.

As Dr. Armin Ernst, assistant professor of Medicine at Harvard Medical School puts it, "Teaching is a priority for us."



AccuTouch bronchoscopy modules include extensive didactic content including videos on how to hold and drive the bronchoscope.

A Great Substitute for Real Patients

"There are two training issues that led to our acquiring the simulator," says Ernst. "One, if you don't have simulation, you train as you go. And, as a patient, do you want to be the first one trained on? There's a patient safety issue."

As Ernst points out, the problem with "train as you go" is getting enough cases in a given time frame to achieve competency. "The number of bronchoscopies each year is not that high, so to get your learning curve up, you need simulators. You can do 20 or 30 a day on a simulator. You can do in a day on a simulator what would take a month on real patients."

In addition to accelerating the learning process through its 24/7 availability, the Immersion simulator includes a wide variety of cases that help broaden student experience. Experienced physicians as well as first time users see the value of simulation.

BIDMC holds five or six bronchoscopy courses each year for fellows, attending physicians, and private practitioners. As many as 20 to 30 doctors attend each course.

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In addition, the center’s internal staff of pulmonary and surgical residents periodically train on the simulator for about 40 or 50 minutes per session. “If you haven’t performed satisfactorily on the simulator, you can’t perform on patients,” says Ernst. “Or, if one of our pulmonary trainees is not making appropriate progress, I can ask them to do more simulation sessions.”

Simulation Training a Strong Trend

Ernst, and BIDMC, believe simulation is an effective training method. Beth Israel has just built a minimally invasive center, and Ernst says it will include surgery simulations and simulations for new procedures that are hard to learn without this technology.

“I believe simulation of medical procedures is generally the way the whole field is going. Not just diagnostic simulation, but the next step is simulation of therapeutic intervention. I see a lot of future potential in the whole technology.”

“With the Immersion simulator, our people are better trained in endoscopy. And something you probably can’t put a measure on, but that I believe to be the case, is that patient safety is better. And the satisfaction of the trainees with their training seems improved.”

Realism and Reliability

Despite its heavy use, Ernst reports very few problems with the simulator over the years. It’s a very robust system.”

Of course, the real measure of the simulator training is how well it prepares students for real procedures. Ernst reports that the Immersion simulator’s realism is “quite good,” saying, “We looked at one or two others. They were cumbersome. And the perception, the tactile feel, as well as the visual feedback, was not on par.”



MODULES

Introduction to Bronchoscopy

This module includes videos covering the entire procedure, an interactive 3D model emulating the tracheobronchial tree and adjoining anatomic structures, and software that teaches the navigation of a bronchoscope in the simulated anatomy. The video includes an external view of the procedure, helping students understand the location of the scope.

Transbronchial Needle Aspiration (TBNA)

Users learn correct use of a cytology needle to biopsy a lymph node. Four cases present progressively difficult anatomies and pathologies, supplying broad experience to extend proficiency. The virtual attending feature advises the user on correct technique and warns of potential harm to the patient.

Pediatric Difficult Airways

The patients in this module range in age from neonates to school age children. The user places an endotracheal tube in either static anatomy for novice users, or dynamic anatomy, in which the patient breathes spontaneously.

Bronchoalveolar Lavage and Endobronchial Sampling

The sampling tools for this module, a needle, forceps, and brush, appear on the video screen after they have been inserted through the working channel of a realistic bronchoscope. Use of the tools will cause tissue deformation and realistic bleeding. The patient breathes, coughs, and exhibits changes in vital signs based on user actions.

Endoscopy Accutouch® System **SUCCESS STORY**

Beth Israel Deaconess Medical Center

A major teaching affiliate of Harvard Medical School, Beth Israel Deaconess Medical Center (BIDMC) is renowned for excellence in patient care, biomedical research, teaching, and community service. It serves close to a quarter million patients annually, provides 529-beds, and has 1,200 physicians on staff, most of whom hold faculty appointments at Harvard Medical School.

The medical center is renowned for excellence in surgery (including general, cardiovascular, thoracic, gastrointestinal, solid organ transplant, and vascular surgery), with minimally invasive approaches to many procedures.

It is also known for treatment of cardiac conditions, cancer, and pulmonary and thoracic disorders; and for expertise in neurosciences, gastroenterology and liver disease, obstetrics and women's health, podiatry, and emergency and trauma medicine. Through its close relationship with the Joslin Clinic, BIDMC is known for treatment of diabetes and its complications, with outstanding results in vascular surgery, podiatric care, diabetes eye care, diabetes and pregnancy, and pancreatic transplantation.

Immersion Medical, Inc.

Immersion Medical designs, manufactures, and markets computer-based medical training simulation systems worldwide. The systems integrate proprietary computer software and tactile feedback robotics to create highly realistic medical procedure simulations that help train doctors. The company's four key product lines are the CathSim® Vascular Access Simulator, the AccuTouch Endoscopy Simulator, the AccuTouch Endovascular Simulator, and AccuTouch Laparoscopic Simulator.

Immersion Corporation

Founded in 1993, Immersion Corporation is a recognized leader in developing, licensing, and marketing digital touch technology and products. Bringing value to markets where man-machine interaction needs to be made more compelling, safer, or productive, Immersion helps its partners broaden market reach by making the use of touch feedback as critical a user experience as sight and sound. Immersion's technology is deployed across personal computing, entertainment, medical training, automotive, and 3D simulation markets. Immersion and its wholly-owned subsidiaries hold more than 240 issued patents worldwide.



Beth Israel Deaconess Medical Center

Dr. Armin Ernst

Dr. Ernst's area of clinical focus includes critical care, pleural disease, and interventional pulmonology, including airway obstruction, pleural effusion, and lung cancer. He attended the University of Heidelberg School of Medicine and residency programs in internal medicine at Heidelberg and the University of Texas Health Science Center. In addition, Ernst participated in fellowship programs at Brigham & Women's Hospital in critical care and at Beth Israel Deaconess Medical Center in pulmonary medicine. He is American Board certified in Internal Medicine, including subspecialties in critical care medicine and pulmonary diseases and now serves as the Director of Interventional Pulmonology at BIDMC.

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