

**FT. WAYNE MEDICAL EDUCATION PROGRAM
FT. WAYNE, INDIANA**

Profile

- Founded 1974, ten new residents accepted each year
- The only family medicine residency program in Ft. Wayne
- Exposure to wide variety of training opportunities

Modules Used

Endoscopy AccuTouch System

- Lower GI Procedure modules
 - o Introduction to Sigmoidoscopy
 - o Introduction to Colonoscopy
 - o Colonoscopy: Biopsy and Polypectomy
 - o Colonoscopy: Basic Polypectomy

Key Training Priorities

- Develop endoscopy skills
- Provide a safe and effective learning environment
- Increase residents' confidence and competence
- Track training progress for determining additional needs

Benefits of System

- Allows residents to experience how tool/tissue interaction should feel
- Helps teach the steps involved in an actual procedure
- Supports learning to complete procedures faster, with less patient discomfort
- Helps to quickly develop competency
- Decreases instructor time
- Provides objective, assessment of performance progress
- Compact and portable



The Fort Wayne Medical Program uses Immersion Medical's endoscopy simulator to develop or enhance skills needed before performing a procedure on a patient.

Endoscopy Training for Rural Physicians

“Sooner or later, every physician has to do a procedure on a real patient for the first time. If we can prepare that physician as well as we possibly can, so that the first time they do the procedure is roughly equivalent or a lot closer to the thousandth time they do a procedure, then we have done well. I have to believe that is better for the patient.”

—Dr. Douglas Boss, Associate Director



BRONCHOSCOPY PROCEDURE 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.

A Needed Training Tool

The Ft. Wayne Medical Education Program purchased its Endoscopy AccuTouch® simulator in 2002 to increase training opportunities in endoscopic procedures for its family practice residents. The program, lead by Dr. Douglas Boss, provides training to approximately 10 family practice residents annually. Residents in the program are expected to complete the curriculum set forth by the American Board of Family Physicians, which includes rotations in specialties such as pediatrics, internal medicine, obstetrics and gynecology, and gastroenterology.

Though the predominant number of residents practice in urban and suburban areas, some move to rural areas. Due to limitations in accessing specialists and hospitals in these locations, practitioners generally must perform procedures, such as upper and lower GI endoscopies, that would otherwise be performed by specialists. As such, training in endoscopic procedures is an integral component of this family practice residency, especially for physicians who will be practicing in rural settings.

“The fact that our doctors in Idaho or Missouri, or here in Indiana, or in Ohio, or some other rural area, are able to provide their patients with endoscopy services has made a difference to those communities,” states Boss.

Before purchasing the simulator, general training in gastroenterology was provided over the three years of residency, but the program offered few opportunities for performing endoscopic procedures. Now, with the simulator, all family practice residents are expected to complete at least 15 virtual flexible sigmoidoscopies before moving on to colonoscopies. Only those residents targeting a rural practice complete all modules.

“When I was given the opportunity to perform a colonoscopy, if I performed well, I would be given more opportunities. It was because of training on the simulator that I was able to obtain hospital privileges.”

—Dr. Jeff Roylance, Family Physician

Better for Patients

Residents usually begin by working on the simulator in the presence of an attending physician who can offer guidance on appropriate use of tools, maneuvering the colonoscope, physiological landmarks, and the actual performance of a procedure.

“The simulator is used to develop skills before they touch a live patient,” explains Boss. “One of the nice things about the simulator is that the resident doesn’t need us there after they have gotten through the initial phase of the training. We actually don’t have to be there to point out what they’ve done wrong. Frequently, just starting again and taking their time is all it takes.”



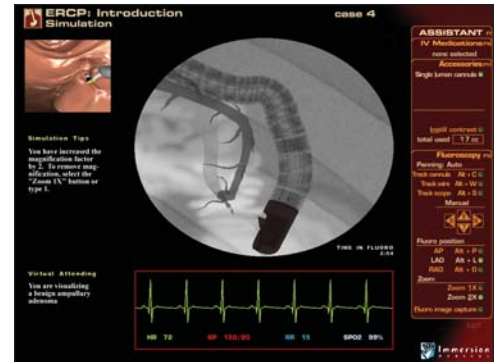
The AccuTouch system reproduces the look and feel of endoscopic procedures with realistic graphics and tactile feedback action.

Boss is a big proponent of medical simulation training because of its benefits for patients. “Sooner or later, every physician has to do a procedure on a real patient for the first time. If we can prepare that physician as well as we possibly can, so that the first time they do the procedure is roughly equivalent or a lot closer to the thousandth time they do a procedure, then we have done well. I have to believe that is better for the patient,” he says. “It’s usually going to go faster. It’s going to be more effective as far as the physician’s actually seeing all the things that they need to see. As far as the patient, it’s usually going to be more comfortable. There are going to be fewer complications. All of these benefits come from medical simulation training.”

Developing Improved Technique

In reflecting on the way he was trained, Boss sees a big difference with today’s simulation training. “The whole learning process is very much in the development of a feel, which is really where the simulator so outstrips all the old models that they had when I was learning,” he says.

“With all the latex models that I had to learn on, the scope just didn’t move in the way that it really does. And yes, you could get it to look left or right, or up and down, and all those kind of things, but insertion, withdrawal, those just didn’t feel the same. And with the simulator, it very much feels the same. With the simulator, the feel is virtually identical to doing it on a live patient. I don’t know how they do it, but it’s that close. And you can certainly see everything that you’re supposed to be aiming at. You can see the anatomy and pathology.”



UPPER GI MODULES

Introduction to Esophagogastroduodenoscopy (EGD)

The Introduction to EGD module provides instruction and practice in performing esophagogastroduodenoscopy. This procedure involves navigating the upper gastrointestinal tract, including the esophagus, stomach, and duodenum, examining the respective lining, and taking cytology samples of normal mucosa and suspicious lesions. The module allows users to track and manage some of the complications that might be encountered in a real procedure. Six progressively difficult cases expand learning by presenting variations in anatomy and pathology.

Introduction to Endoscopic Retrograde Cholangiopancreatography (ERCP)

The ERCP module accurately replicates the sight, sound, and feel of the endoscopic retrograde cholangiopancreatography (ERCP) procedure. Users view a realistic three-dimensional model that visibly responds to scope movement in real-time. The feel of performing the procedure is provided by Immersion's touch feedback (haptic) technology, which reproduces the tactile sensations of scope resistance, tissue stretching, and difficult cannulation. Six cases provide progressively difficult variations in anatomy and pathology.

Having practiced on the simulator, residents are more comfortable, confident, and able to perform the procedure on actual patients, says Boss. Compared to traditional methods of practice where residents used hot dogs to conduct biopsies, the simulator enables them to understand how to navigate the tools, experience how the tool/anatomy interaction should feel, and also learn the steps involved in the actual procedure.

“The learners all like to have a variety of cases. Everybody finds the variation in the voices of the patients to be amusing. The variety is definitely a plus,” states Boss.

When residents are able to successfully perform the procedure on the simulator, they are more ready for that first encounter with a patient. With this preparation, they often can complete the procedure more quickly and effectively, and with less patient discomfort.

“I think it’s much easier on the patient and on everyone involved. As a result of simulator training, I think they are able to achieve a level of competency much faster,” Boss says. “Those that train on a simulator tend to do much better with their first patient than those who have not. It’s an amazing machine.”

Portability and Performance Metrics

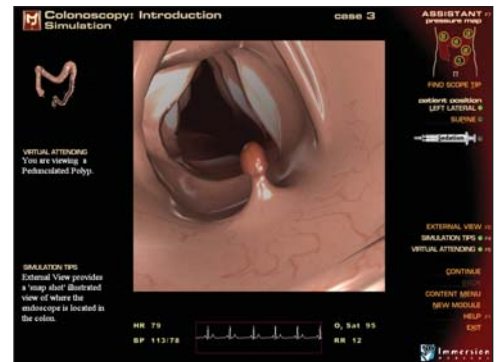
The system’s portability makes it even more desirable for the program. Housed in one of the rooms in the Family Practice Residency program, residents are able to use the system any time. Being a compact unit not much bigger than a computer desk, it can be easily wheeled around for demonstrations, practice sessions, or other training purposes.

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Both residents and the attending physicians use the post simulation evaluation report to analyze the procedure objectively, assess overall performance, determine areas where skills enhancement would be beneficial, and define the direction for further training.

“The reporting aspect on the simulator is very nice,” says Boss. “It supplies a detailed evaluation down to the number of centimeters that the learner was able to advance the scope, the amount of pressure they applied to the side wall, and whether they saw everything they were supposed to see. There are very nice reports on the simulator.”



LOWER GI MODULES

Introduction to Flexible Sigmoidoscopy Module

The real-time graphics show anatomy from actual patients and react like real tissue in real time. The colon expands with air insufflation and collapses with suction. The anatomy and procedure is explained through educational aids including 3D animations, video tutorials, a pathology atlas, and information on indications, contraindications, and complications of flexible sigmoidoscopy.

Introduction to Colonoscopy Module

As in all modules, users handle a colonoscope that looks, feels, and operates like a real scope. Realistic experiences include red-out when the scope tip presses against the mucosa, stool on the lens, and paradoxical motion when in a loop. Various patient cases and comprehensive didactic content is included.

Colonoscopy: Biopsy Module

Trainees use forceps in the working channel of the endoscope to interact with the mucosa and lesions. Interaction between the forceps and mucosa is very realistic, teaching the user the feel of tissue resistance when taking a sample and showing tissue deformation that accurately reflects the amount of pressure exerted by the tool. Intubation of the terminal ileum is also possible.

Colonoscopy: Basic Polypectomy Module

This lower GI module allows users to identify, capture, transect, and remove simulated polyps. Polypectomy equipment including snares, mini snares, hot forceps, electrocautery tips, and an electrosurgical unit are simulated. Complications include uncontrolled bleeding when the polyp head is guillotined, electrocautery-induced perforation, and vasovagal reactions.

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A Resident’s Story

Dr. Jeff Roylance began using Immersion Medical’s Endoscopy AccuTouch simulator during the last two years of his residency at Ft. Wayne Medical Center.

Roylance’s practice sessions on the simulator helped enable him to learn to use the colonoscope and manage difficult cases. “One of the most important ways the simulator helped me was by letting me become familiar with the functioning parts of the colonoscope and gaining an intuitive sense of the dials and buttons. When I had opportunities to use real colonoscopes, I didn’t have to worry about their operation and was more efficient, which increased my confidence, and the confidence of my preceptors in my skills. I was also able to traverse the colon more quickly,” he says.

Today, Roylance is a family physician in rural Missouri. Though endoscopic procedures are not a primary function of his practice, he credits the Endoscopy AccuTouch simulator with giving him the skills to confidently perform these procedures when needed. He says that in many family practice programs, residents are not provided with significant opportunities to perform endoscopies, and he’s glad his training was different.

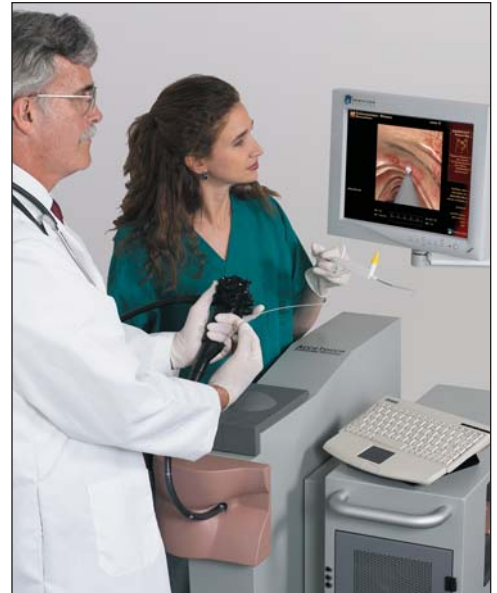
“When I was given the opportunity to perform a colonoscopy, if I performed well, I would be given more opportunities,” remembers Roylance. “It was because of training on the simulator that I was able to obtain hospital privileges.”

Significant Cost Savings

The Endoscopy AccuTouch System’s benefits have been demonstrated by Immersion Medical customers and documented in several clinical studies, available at www.ImmersionMedical.com. In addition, an Immersion-sponsored Frost & Sullivan study found that significant cost savings, in excess of \$352,532, could be achieved through factors including:

- Instructor time savings
- Error reduction
- Faster time to competency
- Reduced equipment breakage

Using median values from the survey data, the study found that the Endoscopy AccuTouch System supplies a payback period of approximately four months.



Endoscopy AccuTouch System

The Endoscopy AccuTouch System is a computer-based simulation system for assisting training 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.

Endoscopy AccuTouch® System **SUCCESS STORY**

About Ft. Wayne Medical Education Program

Fort Wayne supplies exposure to larger numbers of patients and a wider variety of pathology than can be gained in a smaller town. Yet, unlike many family medicine programs, it is the only one in the city, giving residents widely available access to patients.

The Ft. Wayne program includes access to the latest in medical technology, including the most modern CT and MRI scanners, and numerous specialists to assist in training. The program has residents in the only heart transplant center, the only trauma center, and the largest pediatric hospital wing north of Indianapolis.

The program operates from the belief that residents learn best through hands-on experience. While studying and lectures are certainly important, nothing can compare with actually seeing patients and deciding on their course of care. Only through experience can a resident expect to gain an appreciation for the nuances of presentation and subsequent diagnosis and treatment.

About Immersion Medical, Inc.

Immersion Medical designs, manufactures, and markets computer-based medical training simulation systems worldwide. Immersion Medical integrates proprietary software, hardware, and patented tactile feedback technology to create highly realistic medical procedure simulations. These medical simulators allow healthcare providers to repetitively practice procedures in an environment that poses no risks to patients. The company has sold over 1,200 simulators worldwide across their five product lines including the Endovascular, CathSim IV, Endoscopy, Hysteroscopy and Laparoscopy AccuTouch Systems.

About 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 automotive, entertainment, medical training, mobility, personal computer, and three-dimensional simulation markets. Immersion's patent portfolio includes over 600 issues or pending patents in the U.S. and other countries.

Dr. Douglas Boss

Associate Director Boss received degrees in Chemistry, Mathematics, and Theatre Arts from Hastings College in Hastings, Nebraska. He is a graduate of Rush Medical College and completed his family practice residency at Flower Memorial Hospital in Toledo, Ohio. Boss spent eight years in rural practice before joining the Ft. Wayne Medical Education faculty. His practice includes general obstetrics (including obstetric ultrasound) and a full range of endoscopic procedures. His research interests focus on measuring the benefits of continuity of care.



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