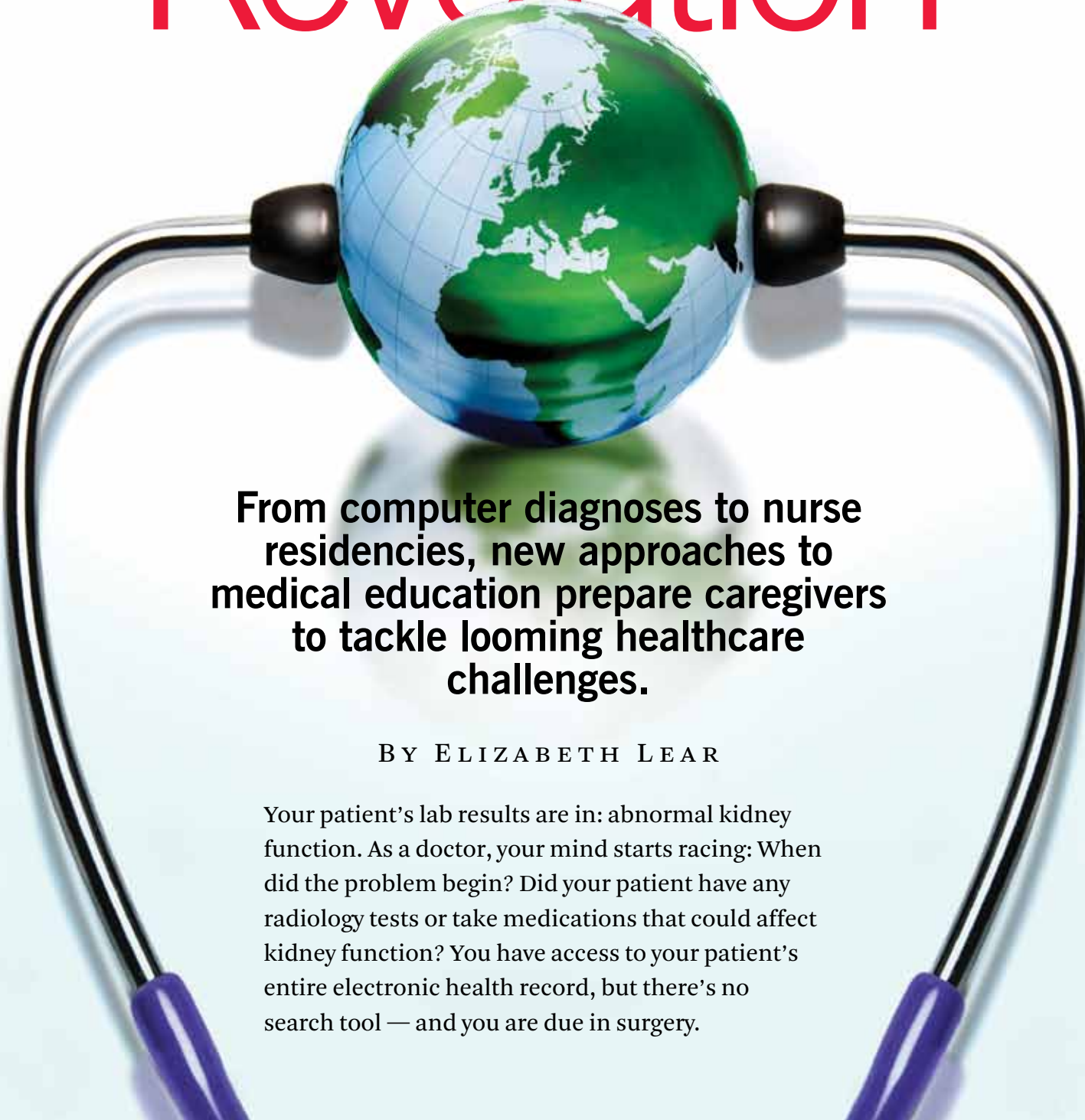


Education Revolution



From computer diagnoses to nurse residencies, new approaches to medical education prepare caregivers to tackle looming healthcare challenges.

BY ELIZABETH LEAR

Your patient's lab results are in: abnormal kidney function. As a doctor, your mind starts racing: When did the problem begin? Did your patient have any radiology tests or take medications that could affect kidney function? You have access to your patient's entire electronic health record, but there's no search tool — and you are due in surgery.

Enter Watson, IBM's computer system and physician sidekick-in-training. Watson can potentially process the record and help answer your questions instantly. Accessible from a PC interface on the clinic floor, Watson may be the key to harnessing the full power of our burgeoning collective medical knowledge and electronic health data.

Watson also represents one of many progressive approaches to how doctors and other medical professionals learn. The computer system made headlines when it trounced its human competitors on *Jeopardy!* in 2011. Since then, the IBM team has loaded Watson with about 50,000 standard medical questions, medical journals and reference materials. As medical students at Cleveland Clinic's Lerner College of Medicine learn the language of modern medicine, Watson learns with them.

In fact, when IBM was looking for a medical education partner on the Watson project, the Lerner College of Medicine topped the list. In the college's distinct learning environment, students work together to analyze and solve medical problems.

Neil Mehta, MBBS, MS, Lerner College of Medicine's Director of Education Technology, explains that Watson can process natural language, so students working with the computer system ask questions through a visual interface. In turn, they receive a flowchart of analysis with arrows winnowing down to a diagnosis. Later this year, in small group classes, medical

students also will use Watson in their learning process and study whether it helps them learn more efficiently.

With students' help, Watson has digested enough information to perform in small pilot studies, testing its mettle as an on-the-spot tool for caregivers. Watson can make the knowledge base of medical research more accessible at the bedside, notes James Stoller, MD, MS, Chair of Cleveland Clinic's Education Institute and holder of both the Jean Wall Bennett Chair for Emphysema Research and the Samson Global Leadership Academy Endowed Chair.


Call Watson a future tool for medicine. When that future arrives, students from Cleveland Clinic will be ready.

PREPPING LIFELONG LEARNERS

The Watson project is the latest education innovation at the medical college that was founded on a radically different model of training future doctors.

"[Our approach] was controversial because we weren't going to be teaching students in the traditional way of giving textbooks to memorize and lectures to sit through. It was going to focus on teamwork, group learning and a problem-based learning system," says James B. Young, MD, the Lerner College of Medicine's Executive Dean and holder of the George M. and Linda H. Kaufman Endowed Chair. With no tests, grades or class ranks, the school launched with many eyes in the academic community watching.

The college's portfolio



"I CAN WALK INTO ANY LAB AND BE ACCEPTED AND WELCOMED TO PARTICIPATE."

—William Tierney, medical student



LEARNING PLATFORMS AND THE PATIENT EXPERIENCE

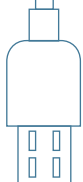
Cleveland Clinic sees the value of investing in the infrastructure needed to train medical professionals. For example, the internally developed Center for Online Medical Education and Training (COMET) e-learning platform allows learners at Cleveland Clinic and around the world to take interactive, multimedia courses for free or at minimal cost. COMET has provided more than a million lessons to date.

The Office of Patient Experience and Center for Healthcare Communication (CEHC) also created and launched the Foundations of Healthcare Communication course. By April 2014, 4,000 Cleveland Clinic staff physicians, residents and fellows had completed the course.

Based on the concept that relationships between provider and patient can be therapeutic to both parties, the one-day intensive workshop teaches the REDE model: Relationship: Establishment, Development, Engagement.

“If you don’t have a relationship first, patients are not going to listen to your medical expertise,” says Katie Neuendorf, MD, who directs the resident and fellow training. The course involves intensive skills-based practice and peer feedback, and participants share common communication challenges and apply new communication techniques.

Adrienne Boissy, MD, MA, Director of the CEHC, notes, “Every clinician I’ve come across genuinely cares about their patients. It’s our job to make sure the patients actually feel that care — that we recognize their fear and can respond to it verbally.”



assessment system, which shows that students have mastered core competencies and skills — rather than memorizing a book or answering a multiple-choice test correctly — is proving successful.

“I figured out what I needed to learn and do,” says third-year Lerner College of Medicine student William Tierney of his experience. “I did not have to re-study material I had already learned in detail just because there was a multiple choice test at the end of the week. Instead, I completed research and focused on material that I was not as versed in. Rather than just one grade — ‘A in

renal physiology’ — you’re assessed on how well you communicate with patients and professionalism, how well you behave as a physician and researcher.”

Mr. Tierney notes that the school’s focus on communication skills helped him stand out on day one of his clinical rotations this year. Likewise, graduates are landing and excelling in the nation’s most prestigious hospital residency programs.

Part of that success comes from a renewed focus on humanism in medicine. Lerner College of Medicine has integrated humanistic topics such as how to address

people and approach patients into its curriculum.

“How we take care of patients has really suffered some blows over time. Because of the intensity of just learning the facts in respect to the practice of medicine, we’ve lost some of the importance of the personal interaction, and things like compassion and communication have suffered a little bit,” Dr. Young says.

THE NEW STUDENT EXPERIENCE

Cleveland Clinic will break ground in fall 2014 on a new physical home for its medical school to be shared in partnership by the Lerner



Then and Now

Medical and nursing education have made radical shifts in the past few decades.

Then: Memorize textbook facts, attend lectures

Now: Practice problem-based learning, meet in small groups, use Watson supercomputer, learn patient communication

Then: Physicians and nurses train in silos, practice on patients

Now: Learn as teams, practice clinical and communication skills in simulation centers

Then: Lecture hall with chalkboard

Now: Small groups and interactive video screens

Then: Full cadaver dissection with aid of *Gray's Anatomy*

Now: Partial cadaver with virtual 3D computer-generated imagery, MRI and CT scans

“Every clinician I’ve come across genuinely cares about their patients. It’s our job to make sure the patients actually feel that care.”

—Adrienne Boissy, MD, MA



“We’re trying to teach the doctors of the future not only to be physician scientists, but also to be team players and to have a thirst for lifelong learning.”

—James Stoller, MD

“If you don’t have the relationship first, patients are not going to listen to your expertise.”

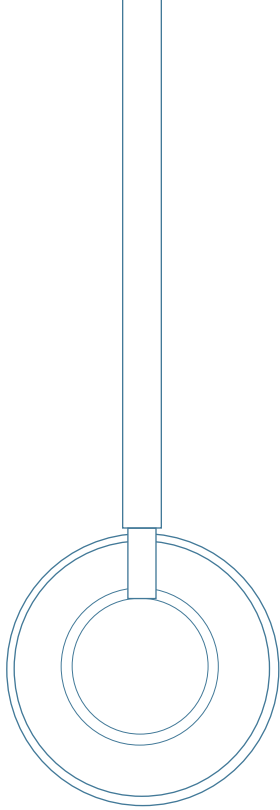
—Katie Neuendorf, MD



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• An artist's rendering of the Lerner College of Medicine's new home

College of Medicine and Case Western Reserve University School of Medicine. The building will sit on Cleveland Clinic's campus and be supported by philanthropy, including lead gifts from the Cleveland Foundation, Medical Mutual of Ohio and Mt. Sinai Health Care Foundation.

With the new campus will come a focus on leadership skills, practice management, quality outcomes and value-based medicine. All of these are increasingly critical in an era of healthcare reform, with a greater emphasis on positive outcomes and the patient experience.

There won't be many traditional classrooms "where a professor stands up and gives a lecture that nobody listens to," Dr. Young says.

Classrooms instead will have several interactive screens that can beam in a faculty member from down the road or the other side of the planet on one, allow students to interact with a simulated or real patient on another, and on yet another screen, access a virtual medical library. Students will make use of technology to its fullest potential — just as they'll be expected to do in practice.

Lerner College of Medicine students are specially trained to serve as physician investigators. In other words, they are trained not only to treat medical problems but to search for new solutions to them in the lab.

"We're trying to teach the doctors of the future not only to be physician scientists, but also to be team players and to have a thirst for lifelong learning, which we think will be skills associated with success over a long career in medicine," Dr. Stoller says.

The program includes a fifth year of study devoted to research. Students also often work toward a joint degree, such as a master's in public health or a doctorate. One student, Robert Koeth, obtained his PhD while serving in the lab of Stanley Hazen, MD, PhD, who holds the Jan Bleeksma Chair in Vascular Cell Biology and Atherosclerosis and the Leonard Krieger Chair in Preventive Cardiology. His thesis research was published in the journal *Nature* on a study exploring gut flora and heart disease risk. The lab's landmark finding was cited as one of the top 10 major advances in cardiovascular

and stroke science for 2013 by the American Heart Association and American Stroke Association. Mr. Koeth matched at Cleveland Clinic for an internal medicine residency with "short track" acceptance into the cardiology fellowship program.

Mr. Tierney is gearing up for an otolaryngology research project next year. Having been at other research institutions before coming to Cleveland, he was impressed by the scientists' open doors at Cleveland Clinic's Lerner Research Institute labs. "I can walk into any lab and be accepted and welcomed to participate," he says.

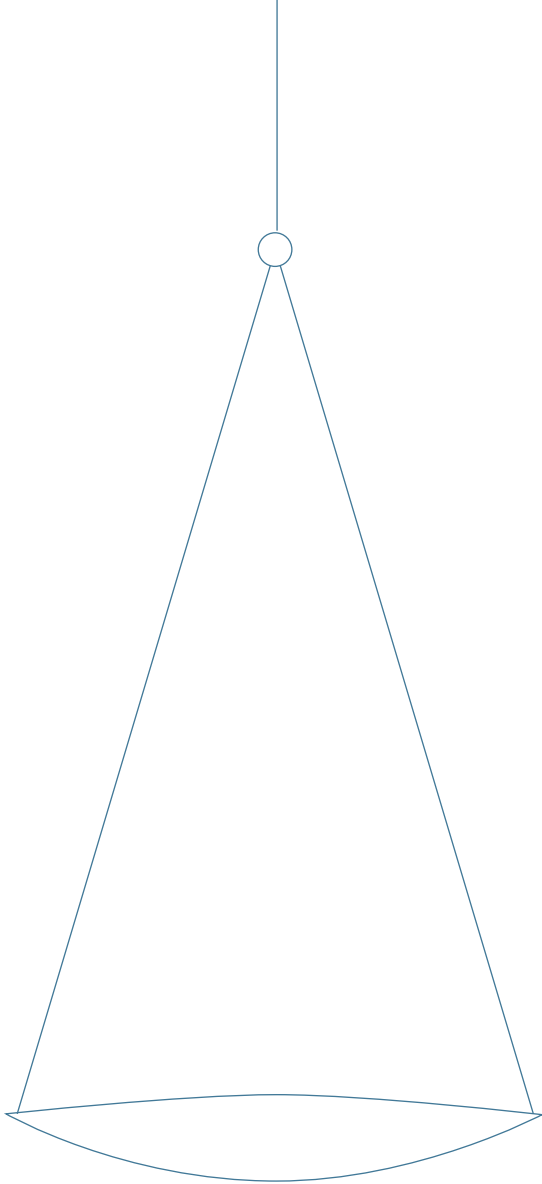
In his first year, Mr. Tierney shadowed a plastic surgeon performing a craniofacial reconstruction procedure, during which he garnered an invitation to collaborate on research. He went on to present the research at the International Society of Craniofacial Surgeons conference in Jackson Hole, Wyo., last September.

THE PUSH FOR PRIMARY CARE

While the Lerner College of Medicine is filling the need for physician investigators, Cleveland Clinic also has entered creative partnerships to address the shortage of primary care doctors.

The American Association of Medical Colleges estimates that the United States will be short 91,500 physicians by 2020. With the help of a \$5 million grant from the Brentwood Foundation, Cleveland Clinic is partnering with the Ohio University Heritage College of Osteopathic Medicine in Athens,





THE ETHICS OF TRANSPLANTATION

Which patients should be at the top of the organ transplant list? How should organ shortages affect organ acceptance standards? Transplantation presents plenty of difficult ethical quandaries, including these.

Cleveland Clinic, with the philanthropic support of former U.S. Treasury Secretary Robert E. Rubin, and his wife, Judith, has established the nation's only current transplant ethics fellowship. The goal of the program, headed by Kathryn Weise, MD, is to train physicians to address the challenges as they evolve alongside transplantation innovations.

The program's first fellow, David Shafran, MD, is helping to develop a curriculum that will familiarize other fellows with the core ethical issues surrounding organ transplantation and provide research opportunities.

Ohio, to open an extension of the college at South Pointe Hospital, a Cleveland Clinic hospital, in 2015.

The program will be based on Ohio University's patient-centered curriculum, which emphasizes a problem-solving, small-group approach. It will enroll 32 students in the first class. Prevention and wellness are priorities in osteopathic practice, with students receiving 200 hours of training in osteopathic manipulative medicine, which includes hands-on treatments for pain, movement ability, and general body function and well-being.

"Ohio University has an extraordinarily stellar record for producing physicians who go into the primary care specialties such as family medicine, internal medicine, obstetrics and gynecology, and pediatrics — and remain in the state of Ohio," Dr. Young says.

Ohio University medical students have rotated at South Pointe Hospital for the past 35 years. And because there are many doctors of osteopathy on staff throughout Cleveland Clinic, it is in a unique position to partner on this program, Dr. Young says.

The demand for nurses also is growing. The number of Americans over age 65 is increasing, and half of U.S. nurses are over age 50 and nearing retirement. This supply-and-demand crunch comes at a time when the Affordable Care Act is granting millions more Americans increased access to healthcare.

In turn, Cleveland Clinic's Stanley Shalom Zielony

Institute for Nursing Excellence has ramped up recruiting efforts for advanced-practice nurses, including nurse practitioners, clinical nurse specialists, nurse anesthetists and nurse midwives, who can provide a substantial range of primary care services.

ASSESS AND IMMERSE

Turnover for nursing school graduates in their first year on the job is as high as 50 percent in some parts of the country. At Cleveland Clinic, it typically hovers around 20 percent. But for participants in a pilot nurse residency program, it's less than 5 percent. This represents a huge potential savings, both in talent and dollars.

In 2010, the Zielony Nursing Institute initiated a four- to six-hour assessment of new-graduate nurse hires and developed a custom orientation for each to improve observation and critical-thinking skills. Nurses who score at the lower end move into a one-week immersion program that uses small-group case studies, clinical experiences and simulation to bring them up to speed. In this program, a new nurse observes a "patient" in an environment much like that of a real medical unit. The nurse is asked to identify possible risks and the clues pointing to an imminent medical issue.

The simulation center is home to surprisingly lifelike mannequins, some of which are complex humanoids with sensors, voices and realistic reactions. Add training equipment, plus videotaping and scenario controls, and the

WORLDLY KNOWLEDGE

CLEVELAND CLINIC'S EDUCATION HAS AN IMPACT AT HOME AND ABROAD.

"We can proudly say that we've had an impact on the health and well-being of patients around the world," Dr. Stoller says. More than 12,500 Cleveland Clinic alumni have gone on to care for patients and educate others in 74 countries. In recent years, Cleveland Clinic has launched programs to meet unique international education needs:

The Fuad Jubran Center for Middle East Medical Education trains visiting physicians from the Middle East as researchers. In turn, the program expects they will return to their home countries to help create medical centers of excellence.

The Samson Global Leadership Academy trains doctors, nurses and administrators in leadership, change management, emotional intelligence, systems thinking and quality improvement. There's a focus on individual development and broad consideration of the diverse components of a large organization.

The Cleveland Clinic Center for Continuing Education's website offers free training with Continuing Medical Education (CME) credits to anyone in the world. It receives a million page views a month, with 15 to 20 percent of visitors from outside the United States.

Arab Health, an annual conference attracting 10,000 attendees to Dubai, United Arab Emirates, has relied on Cleveland Clinic as the sole medical education provider for the past five years.

"One of the greatest strengths we have is our large faculty. We can convene experts in anything, who are current and good educators, and who 'get it' in terms of how it needs to be done," says William Carey, MD, Director of Cleveland Clinic's Center for Continuing Education.

center provides teams of nurses, physicians, medical residents and allied professionals with a nearly real trial run of high-stakes care situations.

"What's so innovative is that this helps a new graduate who's not able to really pull all the pieces together to do that," says Joan Kavanagh, MSN, RN, Associate Chief Nursing Officer. Faculty members describe it as the difference between looking at individual notes of music and looking at a score.

Prior to the immersion program, many nurses who were assessed before and after their orientation remained in the lower assessment category. Since immersion began, no one who

has gone through the program has scored in the lower category. The immersion program also served as the springboard for a nurse residency program launched in January 2014 to help transition nurse graduates into clinical care.

Much like Watson and other unique aspects of medical education at Cleveland Clinic, success in these immersion and simulation programs comes from taking a brand-new look at how people learn.

"Simulation centers are typically pretty similar," Ms. Kavanagh says. "Some are just a little more high-tech than others. Innovation comes in the way you use them." ■



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—Joan Kavanagh, MSN, RN



BITE-SIZE LEARNING

A physician walks into her patient's room. Above the bed, she sees a QR code, a uniquely patterned black-and-white square. She scans the code with her smartphone and receives a five-minute instruction on a particular care protocol for her patient. The QR codes support Cleveland Clinic's initiative to standardize certain care practices, such as rehab protocols, across its health system. The physician earns CME credit for these bite-size nuggets of instruction, learning in context when the information is most needed and most likely to be remembered, says Neil Mehta, MD.