

Medicine That Changes the World

This is Duke Medicine



Driving discovery

Redesigning care

Transforming education

Accelerating progress

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Duke Medicine is here to make a difference. Founded in Durham, North Carolina, in 1930 to improve health care in the Carolinas, we have never lost sight of our reason for being—even as our horizons have expanded far beyond home. With a wellspring of innovative ideas, a deep commitment to the patients we serve, and a healthy dose of daring, we are transforming medicine...and changing the world.

One of the largest biomedical research enterprises in the nation, Duke Medicine is renowned for bringing fresh insights to medical science. Here, researchers and clinicians cross the boundaries of traditional disciplines to move medicine forward, working side by side to translate breakthrough discoveries into better weapons against disease.

Discoveries that make a difference

A world leader in cord-blood transplantation

In 1993, Duke's Joanne Kurtzberg, MD, performed the world's first umbilical cord-blood transplant from an unrelated donor, successfully treating a four-year-old boy with leukemia. Since then, her team has performed more than 2,000 of the procedures to help children with cancer, genetic metabolic diseases, and blood disorders who have exhausted other treatment options—curing more than half of them of their underlying disease. Duke's pediatric cord-blood transplant program is now the largest in the world. Duke has also expanded the use of transplants in adult cancer patients, pioneering the use of cord blood in adults without a matched donor in 1999. Today, Duke physician-scientists are investigating the potential of the stem-cell-rich transplants to treat an ever-wider spectrum of disorders, from stroke to cerebral palsy.



“This is the kind of transformational science that has the potential to change the lives of thousands of people throughout the country and around the world.”

— JULIAN ROBERTSON OF THE ROBERTSON FOUNDATION WHICH FUNDED THE LAUNCH OF THE ROBERTSON TRANSLATIONAL CELL THERAPY PROGRAM AT DUKE

Discoveries that make a difference

Duke researchers have pioneered powerful advances in medicine that extend and improve the lives of people worldwide. Some highlights:



Conquering childhood diseases

Duke Children's physician-scientists have made tremendous strides against serious childhood diseases, from performing the first lifesaving treatment for severe combined immunodeficiency disease (SCID, commonly known as "bubble boy disease") to developing enzyme replacement therapy for infantile-onset Pompe disease, a rare genetic disorder that was previously fatal within the first two years of life. Faculty at Duke Children's also pioneered the use of AZT to prevent mother-to-infant transmission of HIV, introduced the first successful long-term treatment for peanut allergy, pioneered use of the insulin pump for children with diabetes mellitus, and established the first program for thymus transplantation, which can save the lives of children with complete DiGeorge anomaly.

A living miracle: Born with Pompe disease, a genetic disorder once fatal in infancy, Haley Hayes was one of the first children in the world to receive Myozyme—a lifesaving treatment based on Duke research. Now, with regular infusions of the enzyme therapy, Haley and hundreds of other children are growing up—and looking forward to a bright future.

Discoveries that make a difference



Superhuman powers: After injury, zebrafish can grow whole new fins, eye parts, even hearts. Duke scientists have discovered intricate mechanisms by which these fish regenerate tissue and avoid scarring, a key step toward designing stem-cell therapies to repair muscle and nerve damage from heart disease, Alzheimer's, and spinal-cord injuries.

Realizing the promise of regenerative medicine

Duke scientists have made fundamental discoveries about how stem cells give rise to new organs and repair and rebuild injured tissue—findings that pave the way to a new era of regenerative medicine. Preliminary Duke research has shown that stem-cell-based approaches can repair tissue damaged by heart attack, improve exercise capacity in heart failure patients, and reverse certain autoimmune diseases. Duke scientists and engineers are collaborating to grow new heart and cartilage tissue on bioengineered scaffolding, creating potential “patches” for patients with heart disease and osteoarthritis. Cell biologists here are also advancing progress toward regenerating airways in diseased lungs, restoring fertility through improved understanding of gonadal development, and repairing neonatal brain injuries.

Revealing molecular links to disease

By teasing out the genetic, proteomic, and metabolic biomarkers of disease, Duke scientists are opening new avenues to personalized prevention and treatment. Since contributing to the groundbreaking discoveries of susceptibility genes for Alzheimer's disease and breast cancer in the early 1990s—which led to new risk-assessment tests for these conditions—Duke scientists have uncovered genetic links to disorders such as multiple sclerosis, macular degeneration, myopia, autism, cancer, and cardiovascular disease, and developed influential new methods of analyzing the human genome. Research here has also revealed important genetic and molecular signatures that influence the course of an individual's disease and response to treatment: Duke scientists identified the first genetic marker that predicts individual response to hepatitis C therapy—sparing patients the side effects of treatment that's unlikely to work—and have also developed new vaccines and drugs that target specific subtypes of brain tumor, breast cancer, prostate cancer, and colon cancer.



Molecular detectives: Using innovative metabolic profiling techniques and Duke's extensive biorepositories of clinical samples and data, researchers have identified specific genetic and metabolic signatures associated with obesity, insulin resistance, and heart disease—research that could lead to individualized prediction and prevention strategies.

“The problems we're working on are so complex. To solve them takes a community of scientists working together, and that's what we have at Duke.”

—BRIGID HOGAN, PHD, CHAIR,
DEPARTMENT OF CELL BIOLOGY
DIRECTOR, STEM CELL AND
REGENERATIVE MEDICINE
PROGRAM

Big problems require bold solutions. That's why Duke Medicine has taken a uniquely global approach to medicine's most intractable challenges—creating regional, national, and international collaborations that are improving the effectiveness and accessibility of care on an unprecedented scale.

Redesigning care



When a heart attack happens, time is tissue: clinical studies show the longer victims wait for treatment, the more damage is done to their hearts—and their chances for survival. In 2003 Duke and DCRI faculty introduced a new approach to heart-attack care, joining forces with regional hospitals and EMS teams to overhaul treatment protocols so patients receive lifesaving interventions sooner. The RACE-ER program was associated with a decrease in death rates at participating hospitals by nearly 20 percent in four years, and was named one of the top 10 research advances in 2007 by the American Heart Association. It has since been expanded to 120 hospitals and 600-plus ambulance services in all 100 North Carolina counties, and began rolling out nationwide in 2009.

(Pictured: Alamance County EMS team)

“For the first time in decades, heart disease is no longer the leading cause of death in North Carolina—and we believe RACE-ER is one of the reasons why.”

—CHRISTOPHER GRANGER,
MD, CO-DIRECTOR
RACE-ER PROGRAM

Redesigning care

Duke Medicine has introduced innovations in clinical research and care delivery that are redefining the way medicine is practiced, here at home and all over the world.



Weekly Webcasts from the Duke Clinical Research Institute studio disseminate cutting-edge clinical research findings to clinicians around the world, providing the evidence that drives improvements in care. The world's foremost academic research organization, the DCRI has enrolled more than one million patients in clinical trials at 3,600 sites in 64 countries since 1995, and generates more than 700 research papers every year.

Home base for evidence-based medicine

In 1969, Duke began collecting data on how heart patients fared after various treatments, launching what is now the world's largest and oldest repository of cardiovascular outcomes information—and Duke's reputation as an international leader in outcomes research. That databank is now part of the renowned Duke Clinical Research Institute, which conducts multinational clinical studies to improve the quality and effectiveness of medical practice worldwide. Duke Medicine faculty lead the charge, putting research findings into practice by creating evidence-based models of care (p. 6); writing national clinical guidelines for organizations such as the American Heart Association, National Heart, Lung & Blood Institute, and National Comprehensive Cancer Network; and providing on-site clinical guidance and quality oversight to dozens of hospitals across the Southeast through the Duke Heart, Oncology, Neonatology, and Infection Control Networks.

Global collaborations for global health

As one of the world's leading medical institutions, Duke Medicine is taking a leading role in global health—forging international collaborations to reduce health disparities and global disease burdens. The Duke Global Health Institute, a university-wide initiative established in 2006, conducts research, education, and service projects in some 40 countries, including the United States. The Duke Human Vaccine Institute leads two global research consortia funded by the NIH and the Gates Foundation to develop an AIDS vaccine, and Duke faculty collaborate with colleagues in Tanzania and Singapore to pursue advances against emerging infectious diseases such as HIV, tuberculosis, and dengue. Duke Medicine has also launched partnerships in India, China, Kenya, and Singapore to further cardiovascular and cancer training and research, conduct joint clinical research in genetically diverse populations, and strengthen local health delivery systems to expand access to quality care worldwide.



Duke's longstanding partnership with Kilimanjaro Christian Medical Centre in Tanzania has expanded health education and services in one of the world's neediest regions and provided training opportunities for both Tanzanian and Duke health professionals. The collaboration has also yielded important research insights that have quadrupled HIV testing rates and improved adherence to antiretroviral therapy.

Redesigning care

Changing the way we care for communities

For decades Duke has worked with government and private partners to design shared solutions to community health problems, creating novel programs that improve access to care while reducing overall medical costs. Examples include school-based clinics that offer primary-care and mental health services; neighborhood wellness centers that serve as “medical homes” in the heart of underserved communities; and programs that deliver health care to low-income seniors in their homes and help recent immigrants access preventive care. Duke also collaborated with North Carolina’s Office of Rural Health & Community Care in 1997 to pilot one of the first networks that pays care teams to coordinate health services for Medicaid patients. The state now has 14 of the innovative networks statewide, known as Community Care of North Carolina; the program has saved North Carolina more than \$1.2 billion to date. The proven success of these community partnerships in reducing emergency room visits, hospitalizations, and complications from chronic diseases have made them national models for health care reform.

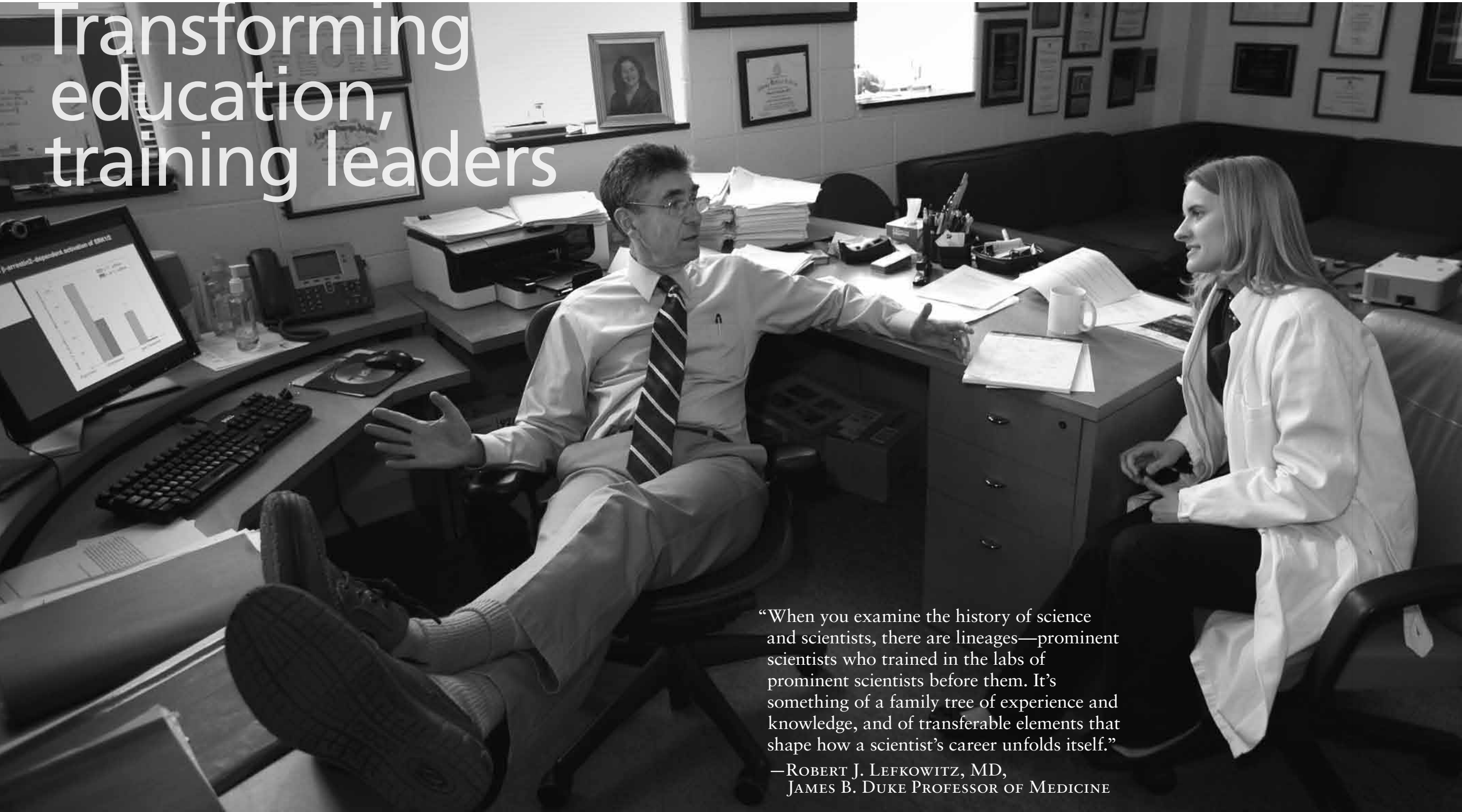


The Duke Cancer Care Research Program has developed innovative “rapid-learning systems” that use real-time patient-reported data on symptoms and quality of life to inform clinical care, research, and quality improvement activities—while improving each patient’s experience. Program leaders have also forged global collaborations to improve the quality of life for cancer patients around the world.

Since 2002, Duke and community partners have helped more than 17,000 uninsured Durham residents access needed health-care services through **Local Access To Community Healthcare (LATCH)**. With the help of LATCH care managers, Edelmira Mundo Hernandez (pictured above with her family) has been able to manage her high blood pressure, in addition to receiving health education and referrals to physicians.

We train students differently at Duke Medicine—because we know the next generation needs to be ready to solve challenges and usher in advances we’ve only begun to understand. From an innovative medical school curriculum that’s become an international model, to first-of-its-kind programs for nurses and other health professionals, Duke Medicine is known for groundbreaking education that prepares our graduates to lead the way to the future.

Transforming education, training leaders

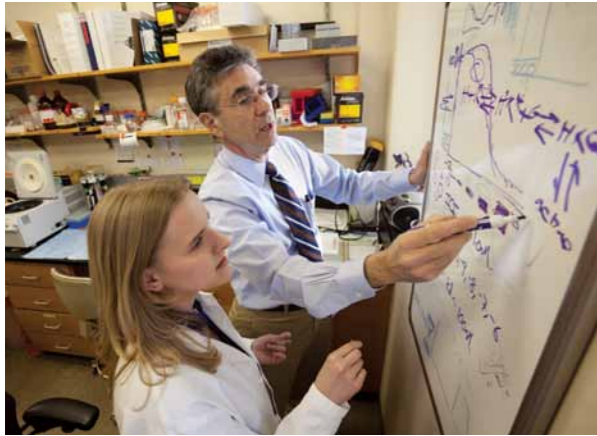


“When you examine the history of science and scientists, there are lineages—prominent scientists who trained in the labs of prominent scientists before them. It’s something of a family tree of experience and knowledge, and of transferable elements that shape how a scientist’s career unfolds itself.”

—ROBERT J. LEFKOWITZ, MD,
JAMES B. DUKE PROFESSOR OF MEDICINE

Transforming education

Designed with an eye toward society's future health care needs, Duke's many innovations in medical and health education have been adopted across the United States and worldwide.



A year that lasts a lifetime

Duke University School of Medicine's signature year of independent study gives students like Erin Bressler (*pictured*) an unparalleled opportunity to investigate research, clinical, or policy interests in depth under the guidance of leading Duke faculty. Bressler works in the lab of National Medal of Science recipient Robert J. Lefkowitz, MD, noted for discovering a superfamily of cell receptors that are now the target of some 40 percent of all pharmaceuticals developed today. Lefkowitz has mentored more than 200 students in his 40 years at Duke, many of whom have gone on to be pioneers in their own right—including medical school deans, biotech CEOs, Howard Hughes Medical Institute investigators, members of the National Academy of Sciences, and more.

Championing teams:

A leader in interprofessional training, Duke Medicine has created courses and case conferences that bring medical, nursing, physician assistant, and physical therapy students together for joint learning and problem-solving—an unmatched preparation for the future of clinical practice.

“Duke takes such care in training its students. It's a learning environment that demands nothing but the best, and in return prepares us to meet future challenges with both skill and compassion.”

—SARAH HALL, PA '12



Transforming education

- Duke's **unique medical school curriculum**, which devotes an entire year to independent scholarship, has become an international model thanks to its success in producing physician–scientists and clinical leaders. The research year enables students to pursue additional advanced training, with nearly 25 percent graduating with a PhD, MPH, MBA, or other advanced degree. Fourteen percent are enrolled in Duke's highly regarded **Medical Scientist Training Program**, among the first three in the United States.
- Launched in 2005 with the support of the Singapore government, the **Duke-National University of Singapore (NUS) Graduate Medical School** offers a joint MD degree from Duke and NUS. The pioneering program is among the world's first such collaborations, and has already spawned both productive research partnerships and innovations in medical education—including a novel team-based approach to training that's now being implemented at Duke University School of Medicine.
- Duke's **School of Nursing was first in the nation** to train master's-level clinical nurse specialists and first to start a gerontological advanced-practice nursing program. The school also led development of the first national curriculum for pediatric acute care nurse practitioners.
- Duke in 1965 created the **nation's first physician assistant program** to address caregiver shortages—launching a profession that's now 74,000 strong.
- Duke is also **addressing projected nurse and nursing faculty shortages** with North Carolina's first doctor of nursing practice program and an innovative accelerated bachelor of science in nursing program that enables college graduates to earn a nursing degree in 18 months.
- In the only collaboration of its kind, the National Institutes of Health Clinical Center has partnered with Duke since 1998 to offer a **master's program in clinical research for health professionals at the NIH**.
- Duke in 2009 launched a first-of-its-kind **Management Leadership Pathway for Residents** to groom physician-executives with MD and MBA or MHA degrees—just one example of Duke's innovations in graduate medical education.
- Dedicated to **preparing the next generation of global-health leaders**, Duke offers students and trainees opportunities to gain experience in addressing health inequalities in the United States and in resource-poor countries through the Duke Global Health Institute, Hubert-Yeargan Center for Global Health, and School of Nursing's Office of Global and Community Health Initiatives.



Khoo Teck Puat Building, the “vertical campus” of Duke-NUS Graduate Medical School in Singapore. Designed to produce a new generation of physician–scientists in Asia, Duke-NUS is one of the first graduate-level medical schools in the region.

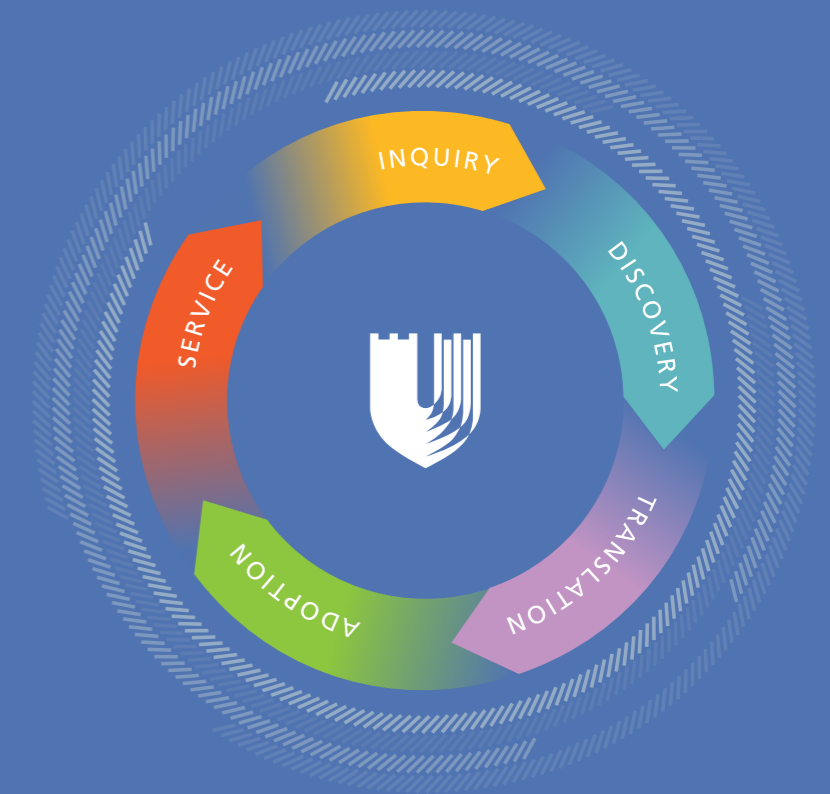


An international leader in gerontological nursing, Duke created the nation's first graduate program to prepare nurses specialized in caring for the elderly, as well as a Center of Excellence in Geriatric Nursing Education that trains practicing nurses and educators from around the world. Faculty have pioneered new models of elder care that promote independent living, improve disease management, and smooth transitions between hospital and community care.

What's next: Medicine beyond boundaries

Duke Medicine Discovery-Care Continuum

Duke has become famous for “outrageous ambition”—to exceed even high expectations and excel in all we do despite challenges, obstacles, or binding tradition. Our passion to bring better medicine to the world shows in every aspect of our work, from research to patient care, education to outreach. But we are impatient to do even more—because the world can't wait for better health.



That's why we are revolutionizing the way medicine has historically been practiced: breaking down barriers between scientific research and clinical care, academic health centers and community caregivers, university-based medical institutions and those in government, non-profit organizations, and private industry who share our commitment to improving health.

With a clear vision to speed the translation of research discoveries into better prevention and cures for all who need them, we have begun the transformation here at Duke Medicine.

Through overarching initiatives like the Duke Translational Medicine Institute, formed in 2006, we are strengthening and streamlining the continuum along which we generate and deliver advances in care to communities—and in turn apply findings from community-based research to generate new scientific priorities.

Through partnering with others in government, industry, academia, and communities near and far, we are sharing and gleaning knowledge that will improve medicine across the spectrum, and around the world.

Learn more:
dukemedicine.org/transformingmedicine



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