VANDERBILT V HEALTH

2024
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2025

Year in Review

DEPARTMENT OF BIOMEDICAL INFORMATICS

"It has been an honor to work closely with a number of very distinguished DBMI chairs over three decades, beginning with Bill Stead. VUMC and all of health care benefit from the many extraordinary contributions DBMI has already made and I know will continue in the future."

JEFF BALSER, MD, PHD
PRESIDENT AND CEO OF VANDERBILT HEALTH
DEAN VANDERBILT UNIVERSITY (VU) SCHOOL OF MEDICINE
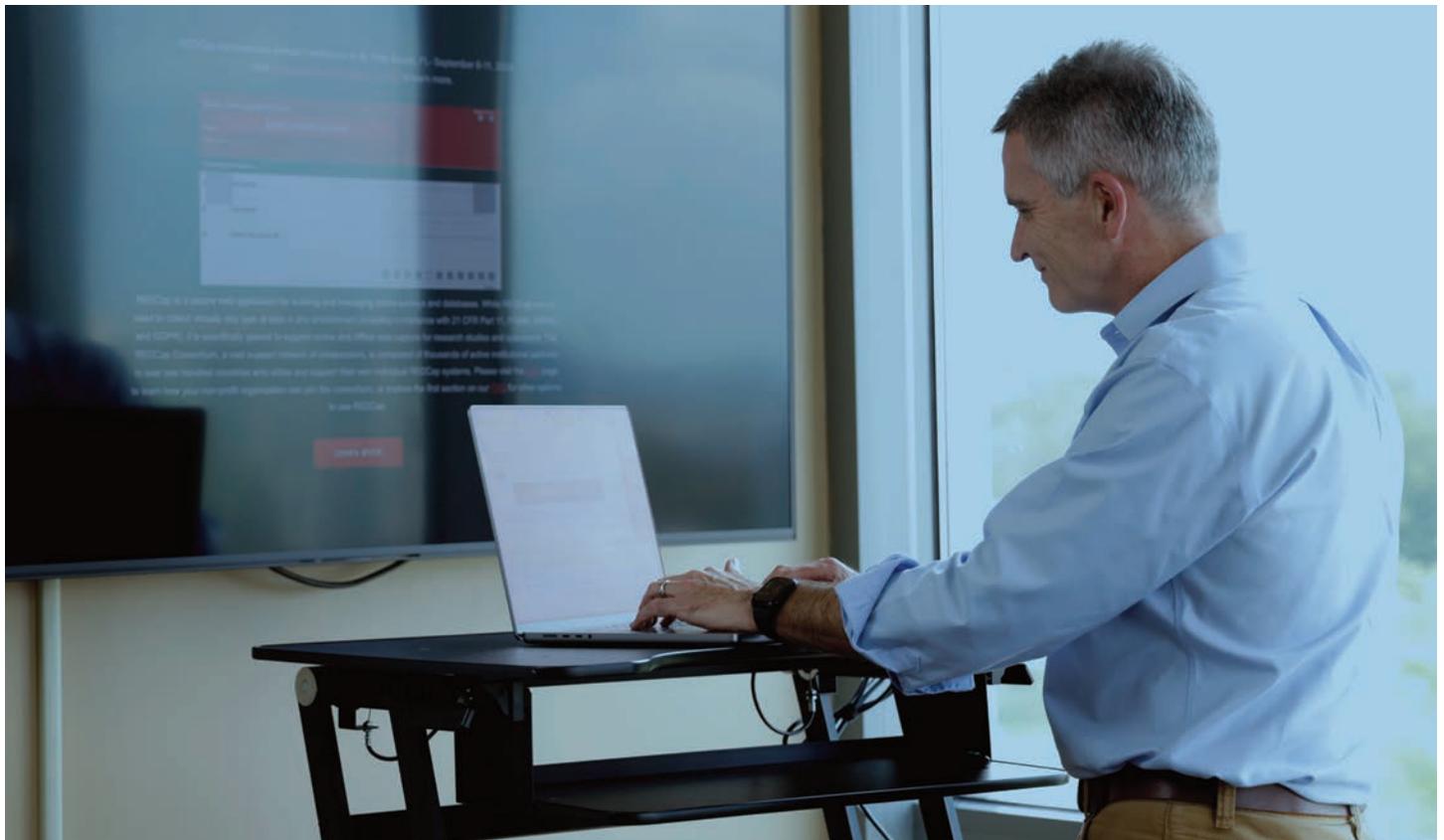
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Letter from the Chair

Dear Colleagues and Friends,

It is my pleasure to present the Department of Biomedical Informatics Year in Review, highlighting our research and educational accomplishments alongside the remarkable 30-year history of this department.

DBMI stands as one of the largest academic informatics programs in the nation, comprising more than 130 primary and secondary faculty members, four graduate and postdoctoral training programs, and a large portfolio of federal and industry funded research and development initiatives.

Our department was built upon the principle that informatics is inherently multidisciplinary and collaborative. Our four research centers bring together faculty and staff to advance public health informatics, precision medicine, clinical informatics, and artificial intelligence. This year's report reflects on more than three decades of transformative work at Vanderbilt, from the early days of pioneering clinical information systems to our current leadership in artificial intelligence and data science. The foundation laid by my predecessors continues to guide our mission to improve health and healthcare through innovative informatics research, education, and practice. Our continued close integration with Vanderbilt University Medical Center — a growing health system — provides unparalleled opportunities to translate our ideas and innovations into practice.

I extend my sincere gratitude to our research staff and administrative team members who demonstrated exceptional dedication over the last year. I take great pride in the work we accomplish at Vanderbilt, and I look forward to the continued impact we will achieve in the year ahead.

With warm regards,

Josh F. Peterson, MD, MPH, FACMI, FAMIA
Chair, Department of Biomedical Informatics
Director, Center for Precision Medicine
Vice-President for Personalized Health
Program Director, Vanderbilt Genomic Medicine Fellowship
Professor of Biomedical Informatics and Medicine
Vanderbilt University Medical Center

"Our continued close integration with Vanderbilt University Medical Center — a growing health system — provides unparalleled opportunities to translate our ideas and innovations into practice."

– JOSH F. PETERSON, MD, MPH, FACMI, FAMIA

Performance Highlights & Financial Summary

DBMI Financial Summary 2024

DBMI's NIH Grants Contribute to Vanderbilt's School of Medicine's Blue Ridge Top Ranking

Vanderbilt University School of Medicine (VUSM) was ranked 5th in the nation in total research grant support provided by the National Institutes of Health (NIH) in fiscal year 2024, according to figures by the nonprofit Blue Ridge Institute for Medical Research.

VUSM, which received $586 million in direct and indirect NIH grant support during the federal fiscal year 2024, has been among the top 10 US medical schools in NIH funding for six of the last 10 years. The school's clinical, research and teaching missions are provided largely through its affiliated, nonprofit Vanderbilt University Medical Center (VUMC).

According to Jane Freedman, MD, the Gladys Parkinson Stahlman Professor of Cardiovascular Research and Deputy CEO, the contributions of DBMI are crucial to the overall top 10 ranking of the institution and to the number 1 national ranking of the Department of Medicine ($277 million) in NIH funding. Many DBMI faculty contribute to this ranking – for example, Paul Harris, PhD, Professor in DBMI, Biomedical Engineering and Biostatistics and Vice President for Research Informatics at VUMC, is the second highest funded principal investigator (PI) among all Department of Medicine PIs in the nation.

$586 million

Vanderbilt University School of Medicine #5 ranking in total research grant support from the NIH in 2024

$277 million

Department of Medicine (includes DBMI) #1 ranked in NIH funding for 2024

$57,935,401

In 2024, Paul Harris, PhD, Professor in DBMI, Biomedical Engineering and Biostatistics and Vice President for Research Informatics at VUMC, is among the top 10 funded principal investigators in the United States ($57,935,401) through his successful leadership of the All of Us Research Program and the NIH/NCATS Recruitment Innovation Center.

Featured: Paul Harris, PhD (left), Alex Cheng, PhD (middle), Cathy Shyr, PhD (right)
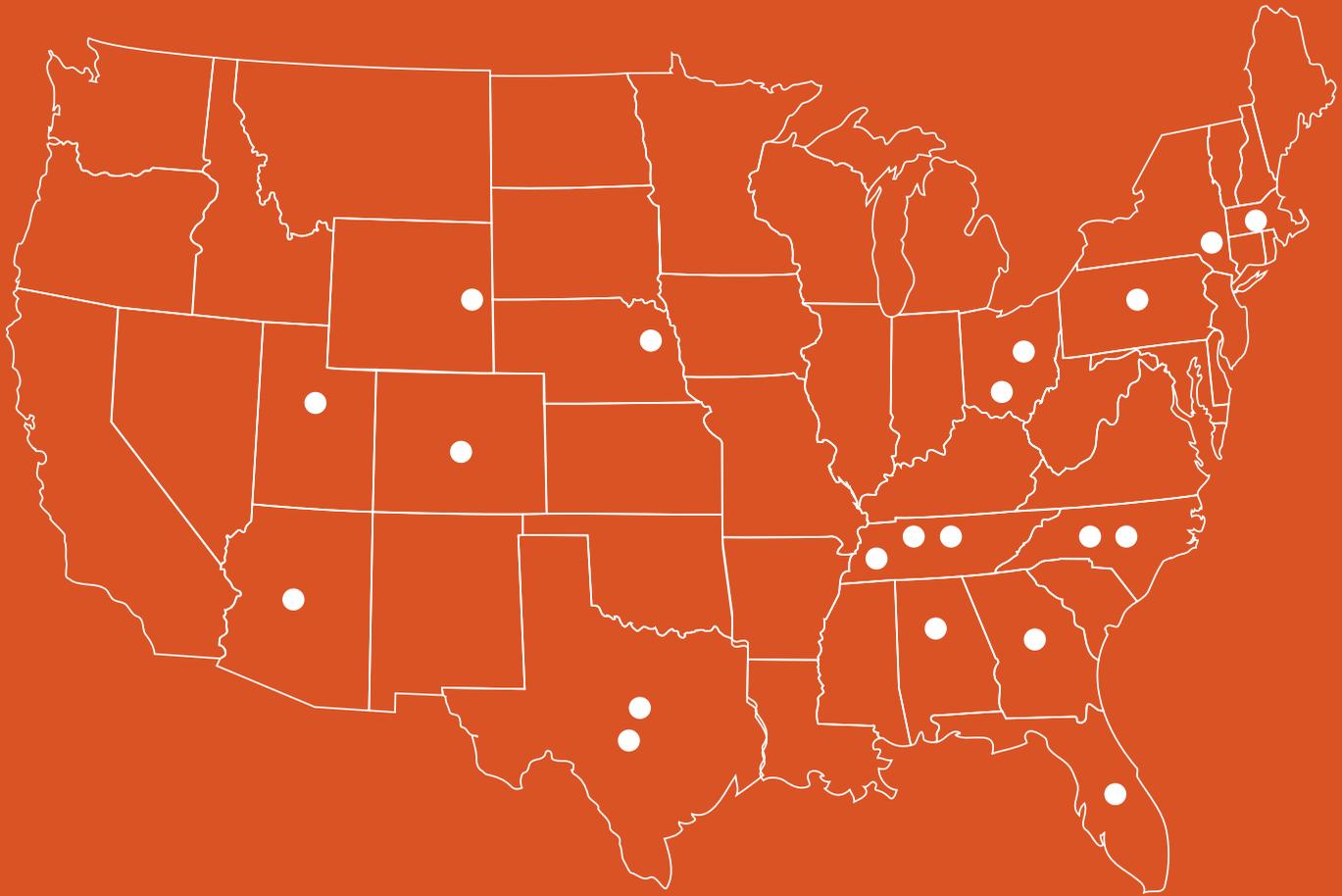
Our partnerships now include over 20 national organizations, reflecting substantial growth as we continue expanding our collaborative efforts nationally and internationally.

Secondary Faculty Areas	Adjunct/Adjoint Faculty Workplaces
Medicine	Baptist Medical Group
Pediatrics	BMInformatix
Anesthesiology	Brigham Young University
Obstetrics and Gynecology	Children's Hospital Medical Center (Cincinnati)
Neurology	Duke University
Dermatology	Ohio State University
Emergency Medicine	Fisk University
Surgery	Heartland Whole Health Institute
Pathology, Microbiology & Immunology	Meharry Medical College
Infectious Disease	Nebraska-Western Iowa Veteran's Affairs Healthcare System
Nursing	American Heart Association
Biostatistics	Imagen AI
Radiology & Radiological Sciences	InterSystems Corporation
Health Policy	National Institutes of Health
Mathematics	RTI International
Biological Sciences	University of Alabama at Birmingham
Electrical & Computer Engineering	University of Arizona
Chemistry	University of Colorado
Computer Science	University of Florida College of Medicine
Political Science	University of Iowa
Biomedical Engineering	University of Pennsylvania
Bioethics	University of Texas Health Science Center

Performance of DBMI for VUMC Fiscal Year 2025 (FY25)

In FY25, the Department of Biomedical Informatics continued our trend as one of the best funded informatics departments in the nation. Our 50 primary faculty generated grant and contract expenditures totaling $72.4 million across all grants and contracts. Research productivity placed DBMI at #3 among all VUMC departments, following #1 Medicine and #2 Pediatrics, both of which have several times more faculty than DBMI.

In addition to earning direct support for DBMI primary faculty, DBMI is a pivotal collaborative force across the institution. DBMI faculty are involved as key study personnel in over $146 million active awards across VUMC in FY25. "Our strength and value as informaticists lie in our ability to both generate groundbreaking primary informatics research and support a vast array of proposals that rely on our expertise in data science, development of electronic medical record interventions, and incorporation of artificial intelligence" states interim chair, Josh Peterson.

Contribution to institutional goals and finances

VUMC sets both institutional and departmental goals each year that DBMI strives to meet. Two of those goals for Biomedical Informatics have direct correlation with our financial performance:

The first is in the area of "Growth & Finance"
This goal measures our margin between our VUMC internal budget allocation and our actual expenditures. Three options exist for meeting the goal: threshold, target and reach. At the end of FY25, we were at reach status which represents a 4% increase over target.

The second is in the area of "Innovation"
This goal measures our actual grant and contract expenditures during the fiscal year. DBMI exceeded the target by 4%.

DBMI Leadership featuring (left to right) Drs. Michael Matheny, Josh Peterson, Adam Wright, Paul Harris, Kim Unertl, Peter Embi, Trent Rosenbloom, Susannah Rose, Laurie Novak, Jessica Ancker

30+ Year Anniversary

Vanderbilt Informatics' Impact Spanning Three Decades

In the mid 1990s Vanderbilt University Medical Center (VUMC) began to undergo rapid transformation in how clinicians and electronic medical systems interacted.

Randolph "Randy" Miller, MD, had just arrived from the University of Pittsburgh to become VUMC's chair of Biomedical Informatics. He was eager to start using his skills as an early informatician to dive into the technical infrastructure of the highly ranked hospital.

But beneath the surface of a functioning workflow was a clunky system that was more troublesome than helpful. A new pilot, called the Computerized Provider Order Entry, or CPOE, that launched in April 1994, focused on improving the hospital's order entry system flipped responsibilities on its head and led to exasperation from all levels of staff.

Physicians on two units were newly required to input orders themselves — a rarity of the time — and as a result, fell behind on patient visits. Nurses, then, could only take emergency verbal orders from physicians. This spurred some doctors to place emergency orders for non-emergent cases. Some unit clerks, who had previously been responsible for documentation and distributing orders to nurses, were becoming recipients of negative feedback.

In summer 1994, Miller and fellow Antoine Geissbuhler, MD, volunteered to walk in the unit clerks' shoes. They sat in the hospital and worked as unit clerks to see for themselves how the system worked in real life.

Miller began brainstorming home-grown solutions. "If we can create our own system and process orders, that would be ideal," said Miller, Cornelius Vanderbilt Professor Emeritus and professor of Biomedical Informatics, Medicine and Nursing. "Our end users, the doctors, nurses and unit clerks, were the most important people to assist."

Randy Miller was recruited to VUMC in 1994 as Professor and Chief of the Division of Biomedical Informatics.

Following the volunteer project, Miller and Geissbuhler invited doctors, nurses and medical students for weekly pizza parties and sat with them in front of computers to customize a new ordering system in real-time. Miller talked with the clinicians, gathering their feedback on the system, while Geissbuhler coded on the backend. The order-placing system lasted for nine months.

"It got to the point where people were complaining about the color of things and not the actual system anymore," Miller joked. "Users' orders must be continuously respected, listened to, and addressed."

VUMC leadership greenlit the new pilot, called WizOrder, and implemented it across the adult and pediatric inpatient units over the course of 1995-2001.

Introducing Vanderbilt's Department of Biomedical Informatics

More than 30 years later, the Department of Biomedical Informatics (DBMI) is thriving with faculty and trainees who innovate within the hospital and lead groundbreaking research locally, nationally, and globally.

The Medical Center's clinical and technical infrastructure has dramatically changed since the early 1990s. Paper patient records converted to electronic health records (EHRs); the enterprise later adopted software from Epic Systems Corp. as its primary clinical interface. As each new season emerged in health care, DBMI leadership and faculty stayed at the forefront of change. The department is a powerhouse contributor to the institution's federally funded research.

"The Department of Biomedical Informatics has played a pivotal role in VUMC's success for decades," says Jeff Balser, MD, PhD, President and CEO of VUMC and Dean of Vanderbilt University School of Medicine (VUSM). "DBMI creates tools that improve the wellbeing of clinicians, staff and patients across the institution and, in many cases, nationwide. At the same time, innovations shaping both research and training nationally and worldwide find their roots in DBMI. It has been an honor to work closely with a number of very distinguished DBMI chairs over three decades, beginning with Bill Stead. VUMC and all of health care benefit from the many extraordinary contributions DBMI has already made and I know will continue in the future."

Current and former members of DBMI take pride in belonging to one of the largest informatics departments in the nation. The department includes more than 50 primary faculty, a substantial team of research staff, and dozens of students and trainees across DBMI's educational programs. Interim Department Chair Josh Peterson, MD, MPH, has closely followed this growth, noting:

"As DBMI has expanded, one of its defining strengths is the breadth of faculty expertise," said Peterson. "We have clinical informaticians who shape the flow and presentation of information at the point of care; research informatics leaders who connect clinically derived data resources with investigators across the institution; informatics experts in public health and precision medicine; data scientists developing novel analytic methods; and faculty advancing the 'basic science' of informatics by addressing fundamental challenges in security, privacy, patient engagement, and artificial intelligence."

"We have an incredible wealth of capabilities and subdomains of informatics performed by multiple people on our staff. We also have one of the most incredible groups of students contributing to that work and elsewhere," said Peter Embí, MD, MS, professor of Biomedical Informatics and Medicine and past chair of DBMI. "And while we have matured as an organization, we're still translating code and writing into practice! It's something we do all the time. We have an incredible opportunity to make huge impacts on the future of health and health care. And that's even more important today than it was 30 years ago."

A unique aspect of Vanderbilt's biomedical informatics structure is that it's deeply embedded across the Medical Center and VUSM. Faculty regularly collaborate across both institutions with colleagues specializing in computer science, engineering, public health, nursing, biostatistics, oncology, global health, radiology, and nearly every sub-specialty of medicine —or often have secondary appointments across these departments.

The department's offices are at 2525 West End Avenue, located off campus across from The Parthenon, a local Nashville landmark. Faculty are only an elevator-ride away from many of the research groups DBMI works with, including the Vanderbilt Institute for Clinical and Translational Research (VICTR). It's the exact environment in which co-creation and open-innovation flourish.

Every DBMI Chair, with their individual passions and expertise, positively influenced the department's success through education, research, clinical informatics, artificial intelligence (AI) and more. All faculty, whether they joined near the beginning or completed their postdoctoral fellowship in informatics this year, make an impact at the hospital. The tapestry of expertise is woven into many of VUMC's landmark milestones over the last several decades.

And impressively, each chair ascended to leadership positions in many founding informatics organizations, including the American Medical Informatics Association (AMIA) and the American College of Medical Informatics (ACMI), and were elected to nationally ranked organizations, such as the National Academy of Medicine (NAM).

In fact, several primary faculty members have been elected

From left, **Drs. Joel McKinsey**, **David Hansen, Antoine Geissbuhler** and **Gordon Tanner** try out the portable WizOrder unit.
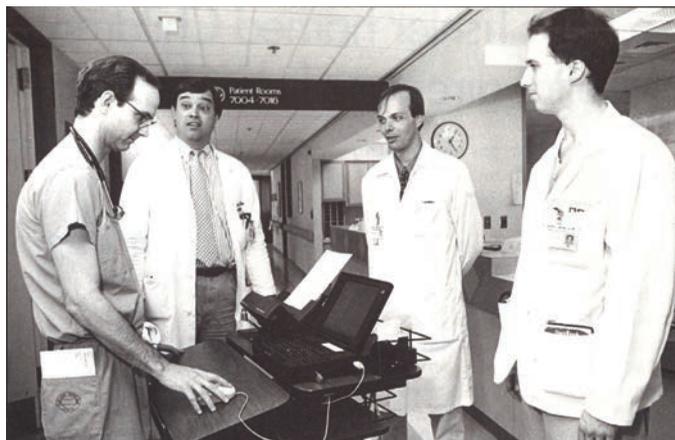
Bill Stead was recruited from Duke University to Vanderbilt University as Associate Vice Chancellor for Health Affairs in 1991, and began forming the Informatics Center.

to NAM, including Mark Frisse, Dan Masys, Bill Stead, Randy Miller, Josh Denny, Brad Malin, Peter Embí and Michael Matheny. This underscores the national impact DBMI faculty have.

The early days

DBMI's decorated history begins with William "Bill" Stead, MD, McKesson Foundation Professor in DBMI and professor of Medicine, who began his medical career at Duke University and trained in nephrology under Roscoe "Ike" Robinson, MD, Director of the Division of Nephrology and CEO of Duke Hospital. In the late 1960s, Duke University became an early developer of informatics tools. As an undergrad, Stead joined the team developing the Duke Cardiovascular Disease Databank, and as a medical student, he developed automated patient history-takers.

Stead went on to become co-developer of "The Medical Record" (TMR), an early computer-based patient record system, and later the principal investigator (PI) of Duke's medical center-wide effort to test and implement an Integrated Academic Information Management System (IAIMS).

In 1981, Robinson left Duke to become the Vice Chancellor for Health Affairs at VUMC. In 1991, he recruited Stead to Vanderbilt as Associate Vice Chancellor for Health Affairs with responsibility for medical center IT, the biomedical library, and a new academic Center for Biomedical Informatics.

In 1993, the Center for Biomedical Informatics was restructured into a division of the School of Medicine with authority to grant primary academic appointments and Stead at the helm. The division was the third academic unit of its kind in the country following the University of Utah and the University of Illinois Urbana-Champaign.

Meanwhile in Pennsylvania, Miller was leading IAIMS efforts at the University of Pittsburgh from 1986 to 1994. He created that institution's first National Institutes of Health (NIH)'s National Library of Medicine (NLM)-funded Informatics Training Program in 1987.

Nationally, informatics was establishing itself as a field. The merger of ACMI, American Association for Medical Systems and

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– JEFF BALSER, MD, PHD

Informatics, and the Symposium on Computer Applications in Medical Care formed AMIA in 1988. And the American Association of Medical Colleges required competency in Medical Informatics in 1999. By 2000, informatics became a formalized specialty in the scientific field.

Miller himself had an unconventional introduction to informatics that started with an asthma attack in medical school.

As a high schooler in the mid 1960s, young Randy Miller began programming computers. He later pursued a medical education at the University of Pittsburgh in hopes of becoming an immunologist—perhaps to discover the roots of the various allergies he had growing up.

One summer when volunteering at an immunology lab, an asthma attack led him to discover his allergy to mice. He went to the emergency room wearing his white lab coat. "Patients were mortified seeing me as a 'doctor', wheezing in the waiting room," Miller said laughing. "My lab leader said later that I should never do a career in a lab."

Miller heard about a new computer assistance diagnostic program at Pittsburgh, led by his soon-to-be mentor Jack Myers, MD, chairperson of the Department of Medicine, and he remembered his childhood passion for technology. "Since I knew I wasn't allergic to computers, I volunteered to work on that project. Here I am, 50 years later," Miller said.

Crossing paths

Miller and Stead frequently encountered each other at medical conferences throughout the 1970s and 1980s. Fate eventually brought the two together in 1988, when they both served on the NLM's Biomedical Library Review Committee, where they evaluated informatics grant applications.

In 1992, the Dean of Columbia University's College of Physicians and Surgeons invited both Miller and Stead to be consultants to help determine whether the Center for Medical Informatics led by Paul Clayton, PhD, should be promoted to departmental status — it subsequently was.

After working together assisting Columbia — discussing philosophies, ideas, and pragmatic approaches — Stead subsequently asked Miller to consider becoming chair of the recently established Division of Biomedical Informatics at Vanderbilt.

The Division, predecessor of today's department, was part of the School of Medicine and the Informatics Center. The Infor-

Nunzia Giuse, MD, current Vice President of Knowledge Management and professor of Biomedical Informatics and Medicine at VUMC

matics Center also included the Eskind Biomedical Library and personnel responsible for the Medical Center's IT infrastructure. The vision was a partnership, where Miller would grow the education and discovery capacity of DBMI with the rest of the Informatics Center providing an applied laboratory for faculty and trainees.

Miller was enticed by the opportunities, organizational infrastructure, and growing informatics capabilities that Vanderbilt offered. Given the recent retirement of his decades-long mentor at Pitt, Jack Myers, Miller jumped at the opportunity. Yet, he had one critical stipulation. Myers urged Miller to "never go from one academic institution to another unless you bring along enough talented individuals to guarantee success."

"Randy's recruitment created instant scale," Stead recalled. Miller joined Vanderbilt as chair on May 1, 1994. Miller, with Stead's backing, brought with him from Pittsburgh key faculty contributors: Dario and Nunzia Giuse, and informatics fellows Steven Brown, MD, and Geissbuhler.

"The reason why I chose to follow Randy was because Bill Stead implemented a new care provider ordering system, and Vanderbilt was the perfect place to implement decision support systems," said Geissbuhler.

At the time, Geissbuhler had just arrived in Pittsburgh from Geneva, Switzerland, before heading to Nashville. "I soon realized that implementing tools that change the way people work is not about the technology itself, it's about understanding people and the human factors, and finding the best way to create a new experience and change the way people think about those information systems," he said.

Bringing knowledge base management to Vanderbilt

Before Miller's departure, medical students, clinical fellows, and faculty members at the University of Pittsburgh had, for two decades, spent elective time working under Myers and later under Miller and Nunzia Giuse. They constructed a literature-derived knowledge base to support computer-assisted clinical diagnosis. Volunteers each selected a disease of interest and spent two to four weeks full-time in the library, researching and creating lists of the findings reliably reported to occur in patients with the selected disorder.

Over two decades, the team described in meticulous detail an average of 85 findings apiece for more than 600 diseases. This effort underpinned what Miller called "the best diagnostic knowledge base in medicine" at the time. At Miller's request in 2010, Pittsburgh transferred the intellectual property rights to the INTER-

NIST-1/QMR knowledge base to Vanderbilt, so that Miller could more easily extend its scope. The renamed VanderbiltDDx Knowledge Base is still being used to this day to publish research at Vanderbilt.

By the mid 1990s, Stead successfully achieved funding from the NLM via an IAIMS grant to support startup packages to recruit primary faculty. Simultaneously, the newly established Annette and Irwin Eskind Biomedical Library at Vanderbilt had become the home of the Informatics Center and was instrumental in the implementation and success of VUMC's IAIMS. Miller initiated Vanderbilt's NIH/NLM sponsored Biomedical Informatics Training grant in the late 1990s.

Nunzia Giuse, MD, current Vice President of Knowledge Management and professor of Biomedical Informatics and Medicine at VUMC, describes what the early changes meant for the institution's growth. "In 1994, all journals were exclusively print, requiring clinicians and researchers to visit the library for access, and 1995 marked a turning point: with the online availability of a single journal, a new era of desktop access to library resources began. Although browsing the print stacks remained a valued experience, by 2013, only one journal remained exclusively in print. This dramatic shift in information accessibility significantly facilitated the adoption of evidence-based practices," she said.

Around the turn of the millennium, the key building blocks of what would become the current DBMI fell into place.

Building blocks of DBMI

From 1994 to 2001, a new era in clinical informatics took place at VUMC under Miller and Stead:

• Stead received a 5-year, $5 million IAIMS implementation grant and began hiring full-time informatics faculty via the VUSM, creating a pipeline of academic informaticians to both advance the science and help transform day-to-day clinical practice.

• Miller and Geissbuhler oversaw the rollout of WizOrder to the hospital to provide relevant "point-of-care" information resources to enhance and support clinicians' decision-making at the time of order entry. Together, WizOrder and StarPanel – supported by the IAIMS grant, faculty recruitment, and strong administrative infrastructure — cemented VUMC's place at the forefront of clinical informatics.

• In 1994, DBMI hired its first full-time administrative staff member, Joyce Green, who now oversees Faculty Affairs with longtime biomedical informatician Trent Rosenbloom, MD, MPH.

• Dario Giuse brought the Medical Archiving System (MARS) from the University of Pittsburgh, giving users easy access to patient data. Then Dario developed from the ground up more efficient and effective successors: StarChart and StarPanel. These applications, along with WizOrder, would be VUMC's core clinical information systems for the next 20 years.

• Stead recruited Nancy Lorenzi, PhD, MLS, MA, (currently professor emerita) to DBMI as vice president of Strategic Change Management at VUMC. She collaborated with Nunzia Giuse to implement StarPanel and other major initiatives, including My Health at Vanderbilt.

• Miller recruited Kevin B. Johnson, MD, MS, to become vice chair of the new Department of Biomedical Informatics in 2002. Johnson later served as chair of DBMI from 2010 to 2020.

• Nunzia Giuse became director of the Eskind Biomedical Library and developed a new model for librarians and informaticians to work with physicians and use the knowledge base to answer care-related questions.

• Miller gained approval from VUSM for DBMI to gain Departmental status in 2001, and concurrent permission from the Graduate School for the Biomedical Informatics MS and PhD degree programs.

• By 2001, DBMI had 18 faculty members; 13 of them had primary (or dual primary) appointments; two primary DBMI faculty members had earned tenure by that time.

"When DBMI started, informatics was a foreign word at VUMC, and the clinical world simply did not rely on technology," said Dario Giuse, Dr. Ing, MS. "There was no EHR, no decision support, and basically no computers in any clinical areas."

"We implemented technology in a world of medicine at a time when it was really hard," said Nancy Lorenzi. "It's good to come back to people. DBMI does a really great job with pulling people together."

"DBMI's growth and expansion over the past three decades have been phenomenal, but not surprising. After all, the department was built on a solid foundation with Dr. Randolph (Randy) Miller at the helm as Founding Chair, and Dr. William (Bill) Stead as Director of the Informatics Center and Associate Vice Chancellor for Health Affairs. In addition to Miller and Stead, the early core group in 1994 included (among others) Drs. Nunzia and Dario Giuse, Ms. Carol Aronson, myself, and trainees Antoine Geissbuhler and Steven Brown. I thank them for laying the

Dario Giuse developed StarChart and StarPanel.

groundwork years ago for DBMI to achieve excellence in innovation while demonstrating unwavering commitment to serve the community, and for building upon it so that others could take up the future charge," said Joyce Green."I am grateful for the privilege and honor of working alongside them during DBMI's amazing 30-year journey. Here's hoping for its continued growth and success!"

In 2001, DBMI was elevated to a Department of the VUSM, and educating future informaticists became the next big step.

Educating future informaticians

Miller, who often advised biomedical engineering students interested in working on informatics projects, formally established a master's and PhD degree program in biomedical informatics. In 2000, he recruited Constantin Aliferis, MD, PhD, from Athens University to become the program's founding director. The first DBMI graduate students joined in fall 2001.

Dominik Aronsky, MD, PhD, joined the faculty in 2000 from the University of Utah and succeeded Aliferis as director of the MS/PhD program. Together with program manager Rischelle Jenkins (who joined in March 2001 and celebrated her 40th work anniversary at Vanderbilt University in 2024), the duo focused heavily on student recruitment and curriculum and program design until Cynthia Gadd, PhD, MBA, MS took over as program director in 2005.

In 2002, Miller obtained the NIH/NILM T15 grant, which provided stipends and tuition for DBMI's MS and PhD students.

The T15 program offers graduate education, postdoctoral training and research experiences in a wide range of areas including health care informatics, translational bioinformatics, clinical informatics, public health informatics, and consumer health informatics. Today, VU/VUMC is one of 18 institutions across the U.S. benefiting from the T15 grant.

"We have the largest and most diverse department of biomedical informatics in the country, so our trainees get the benefit of a wide range of expertise and research opportunities, as well as a fantastic faculty-student ratio," said Jessica Ancker, PhD, MPH, professor of Biomedical Informatics and Health Policy and current vice chair for Educational Affairs in DBMI. "We are closely integrated with the hospital, giving trainees an opportunity to work directly with hospital systems and practicing clinicians. Vanderbilt also has a unique decades-long investment in data resources for research, so students can access unusually rich datasets of real medical data."

Along with Cynthia Gadd, Brad Malin, PhD, Accenture Professor of Biomedical Informatics, Biostatistics and Computer Science and current vice chair for Research Affairs in DBMI, and Jeffrey Blume, PhD, Adjoint Professor of Biostatistics, also received a T32 grant called "Big Biomedical Data Science" (or BIDS) that ran for five years from the Big Data to Knowledge (BD2K) program at the NIH. This program also supported students from across the Vanderbilt University School of Arts and Sciences, Engineering, and Medicine.
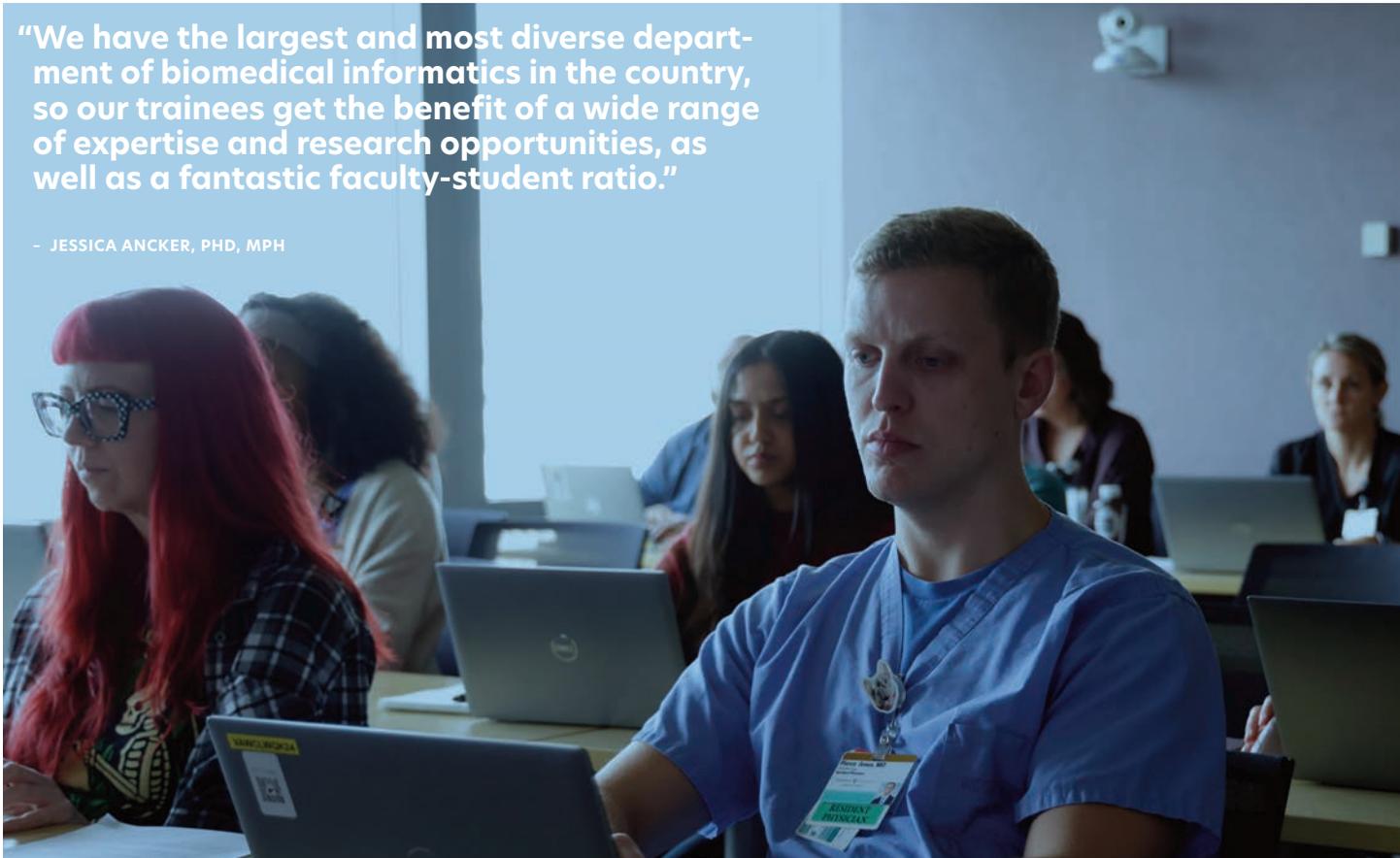
"We have the largest and most diverse department of biomedical informatics in the country, so our trainees get the benefit of a wide range of expertise and research opportunities, as well as a fantastic faculty-student ratio."

– JESSICA ANCKER, PHD, MPH

Reaching Future Generations of Informaticians

In 2008 under the leadership of Cynthia Gadd, PhD, MBA, MS, DBMI started a summer internship program for undergraduate students with funding support from the NLM.

After initial exploration of how the department could engage with younger learners, the program's goals expanded to focus on building new pathways into biomedical informatics. The program began to connect with local high schools to reach talented individuals even earlier in their education. Kim Unertl, PhD, MS, Associate Professor and current Director of Graduate Studies in DBMI, became director of the Vanderbilt Biomedical Informatics Summer Program (VBISP) in 2017. She and co-principal investigator Brad Malin received funding from the National Science Foundation to establish a Research Experience for Undergraduates site in 2018. The funding allowed DBMI to expand the program and to integrate additional training components.

Over the last 17 years, the program has engaged more than 100 high school, undergraduate, and graduate students in meaningful biomedical informatics research projects. These students have gone on to pursue medical degrees, graduate degrees, and career pathways in STEM fields. Many former VBISP interns have also joined DBMI as faculty members and graduate students.

In 2023, Unertl joined with colleagues at neighboring Historically Black Colleges and Universities (HBCUs) Fisk University and Meharry Medical College to obtain funding from the NLM that allowed the department to build a new collaboration around undergraduate and graduate students from Fisk and Meharry.

Entering the research era: Dan Masys

By establishing the MS/PhD program, and follow-on postdoctoral fellowships, DBMI leadership created the foundation needed to foster the future of informaticians. The next stage of advancement was research.

In 2002, Stead received grant funding from the NLM to develop an organizational framework for biomedical information science and technology to maximize multidisciplinary research. Joining the project's external advisory committee was Dan Masys, MD, a colleague of Miller and Stead from his time as director of the NLM's research division under the National Center for Biomedical Communications.

Masys was impressed by what he encountered during a 2004 Advisory Committee meeting.

"This was a medical center where senior leadership valued informatics. The power of knowledge management and technology was like what no other medical center was doing at the time," said Masys. "[Vanderbilt] was putting its money where its mouth was for having informatics create state-of-the-art technology and look to the future of molecular medicine and personalized care based on genomics and molecular variation."

Shortly thereafter, Stead called Masys to share that DBMI had an opening for a new department chair. Soon, Masys took the helm following the tenure of Miller.

Boosting DBMI's research capabilities came naturally to Masys. He had extensive time in the NIH, experience as a director of biomedical informatics programs, and connections in the re-

Over the past 17 years, the summer internship program has engaged more than 100 high school, undergraduate, and graduate students in meaningful biomedical informatics research projects. Featured above: The VBISP Class of 2025.

search world. "I had always been a research critter from the very start," said Masys. "The connections of a research community made it easier for me to recruit a new group of researchers to DBMI. We had a good momentum of people joining who were willing to tackle real-world problems and create solutions in the service of one's career and Vanderbilt as a world-class institution."

Masys embodied high-level expertise as well as humility, which set an example for rising stars, including Joshua Denny, MD, MS, Chief Executive Officer of the All of Us Program, Brad Malin, and Paul Harris, PhD, professor of Biomedical Informatics, Biomedical Engineering and Biostatistics, director of VICTR, and creator of REDCap — which celebrated its 20th anniversary in 2024.

Harris recalls how Masys changed his perspective about the trajectory of his early career. Harris went with Masys to an important meeting with VUMC clinical leadership, and Masys was "singing praises" about Harris's work to the group.

"I felt really good about that! We then walked out of the door and down the corridor before he stopped me and said, 'Never believe your own press,'" Harris said laughing. "It was said at the right time, like, 'Don't get the big head.' He was saying that to me even after everything he accomplished. That shaped who I am today as a human being, not just an informaticist."

"In my annual speech to new DBMI students, I would always say, 'It's not what you know, it's what you do with what you know that counts,'" said Masys.

The power of translational informatics & personalized medicine

Under the leadership of Masys, who served from January 2005 to May 2011, many critical projects in the fields of genomic and personalized medicine came to life.

"In my annual speech to new DBMI students, I would always say, 'It's not what you know, it's what you do with what you know that counts,'" said Masys.

– DAN MASYS

Dan Masys was named chair in 2002, bringing an extensive background in research.

BioVU, the world's largest biobank at a single academic institution, was launched at Vanderbilt in 2007. This biorepository houses DNA extracted from discarded blood collected during routine clinical testing and linked to de-identified clinical and demographic data. The goal is to explore the relationships between genetic variation, disease susceptibility, and different drug responses a person may have. In 2022, BioVU reached more than 300,000 biological samples,

"It has trained a generation of data scientists," Dan Roden, MD, professor of Medicine, Pharmacology and Biomedical Informatics and senior vice president for Personalized Medicine at VUMC, who holds the Sam L. Clark, MD, PhD Chair, said in VUMC News. "It has attracted new faculty and trainees. It has allowed us to develop a national and international leadership position in personalized and precision medicine."

The creation of the Electronic Medical Records and Genomics (eMERGE) network brought together different institutions across the U.S. to collect DNA and share EHR-based data for phenotyping to conduct large-scale genetic research. eMERGE was organized and funded by the National Human Genome Research Institute.
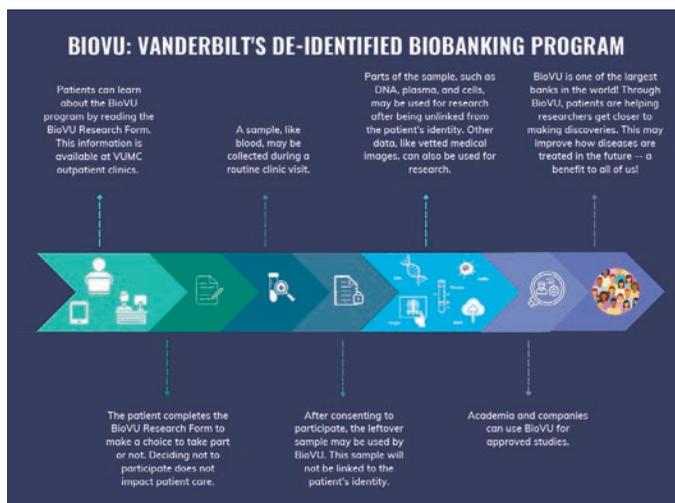
The Pharmacogenomic Resource for Enhanced Decisions in Care and Treatment (PREDICT) program is a clinical decision-support system that tests patients for genetic variations and helps physicians choose prescription drugs and dosages that are best for them. PREDICT was launched in 2010 and overseen by Denny, Peterson, and Roden.

According to Masys, programs like BioVU and PREDICT led to a series of crucial NIH grants and projects, many of which are still active today. They also positioned VUMC as an "active" health care enterprise, rather than "reactive", when it came to diagnoses. DBMI became a leader in interventional informatics and took new knowledge like genomic data back to clinical decision making.

"Vanderbilt was one of the first to gather that information about your personal susceptibilities as evidenced by variations of your genome," said Masys. "You can have that information on-hand before doctors made a diagnosis years later."

For physician-researchers like Josh Peterson, MD, MPH, director of the Center for Precision Medicine and interim chair of DBMI, there is still much work to be done when it comes to directly impacting patient care using genomic data.

"There is still a large gap between what we see in our research data in terms of unrecognized genomic diagnoses and risks and what is tested in clinical practice," he said. "That gap between evidence and practice is motivating — we start to see how informatics can make hidden biological risks accessible to clinicians and patients."

"We were doing health care in the purest form: understanding ahead of time what health events might happen for you in the future. That objective is still alive and well," said Masys.

Connector in chief: Kevin Johnson

Thanks to Masys, VUMC's research infrastructure became a well-oiled machine, and DBMI, which grew to house more than 60 primary faculty at the time, was ready for someone to bridge all of its educational, research and clinical programs together during a time when EHRs were rapidly changing, and clinician burnout was becoming a critical issue across the country.

Kevin Johnson, MD, MS, pediatrician and informatician, was recruited from Johns Hopkins Hospital in 2002 and appointed vice chair of Biomedical Informatics. Johnson was quickly noticed by DBMI leadership as someone not only passionate about clinical informatics and improving patient safety through innovative technology, but harmonious among faculty, staff, students and patients.

"It was obvious that he could run the department," said Stead, who led the chair search committee following Masys's retirement. "Kevin was an inclusive leader who nurtured all the pieces. He brought everyone and everything together."

Johnson was appointed chair of DBMI and chief informatics officer in Health Information Technology (HealthIT) in 2012, and later senior vice president of HealthIT in 2014. In both roles, Johnson made monumental changes across the institution.

Specifically, Johnson oversaw the implementation of Epic's electronic health system, eStar, from StarPanel, which simultaneously went live across all VUMC sites in November 2017. This multi-year transition was considered the "most significant clini-

cal infrastructure change in the history of the Medical Center," according to The Tennessean.

The endeavor was like "changing the engine mid-flight," Johnson told the news outlet. "Everyone wanted to have an informatics representative after that," he said.

Throughout his tenure, Johnson also created opportunities for DBMI faculty to advance their careers and focus on different aspects of informatics while also contributing to the enterprise:

• Three vice chair roles were created for Faculty Affairs (Trent Rosenbloom), Research (Brad Malin), and Educational Affairs (Cindy Gadd and Jessica Ancker, who succeeded Gadd in 2021; faculty member and DBMI alumna Kim Unertl, PhD, who was named director of Graduate Studies in 2020). An additional vice chair for Business Affairs role was created for Mark Frisse, MD, MS, MBA, professor emeritus in DBMI.

• Several centers were established to focus on clinical informatics (under Adam Wright, PhD), population health (Michael Matheny, MD, MS, MPH, which then expanded to encompass public health with the recruitment of Melissa McPheeters, PhD, MPH), precision medicine (Josh Peterson), health data science (Brad Malin), and knowledge management (Nunzia Giuse).

• He also oversaw the department's relocation from the fourth floor of the Eskind Biomedical Library to the 8th, 14th and 15th floors of 2525 West End Avenue to spur more collaboration within DBMI.

Kevin Johnson was recruited from Johns Hopkins to Vanderbilt in 2002 and appointed vice chair of Biomedical Informatics.

"It was an exciting opportunity to build and expand VUMC's research in an area that is inherently multi-disciplinary," said Matheny, director of the Center for Improving the Public's Health through Informatics (CIPHI). "Population and public health informatics itself bridge biomedical informatics, biostatistics, and epidemiology in the conduct of supporting the health and well-being of patients and their families, at a health system and society level. Kevin clearly saw the need for the Department to invest in this area, and his support and mentorship was critical to our success."

On the HealthIT side, Johnson worked closely with Neal Patel, MD, MPH, professor of Pediatrics, Biomedical Informatics and Anesthesiology, to further integrate HealthIT into the research infrastructure of VUMC. Together with DBMI leadership, they worked on numerous projects that empowered clinicians and improved their workflows in an era of great change. VUMC opted to partner with vendors for EHR needs rather than keep building on top of the original homegrown solutions.

"Back in the WizOrder and StarPanel days, our faculty and clinicians knew they could innovate directly in the EHR," explained Adam Wright, PhD, director of the Vanderbilt Clinical Informatics Center (VCLIC) and professor of Biomedical Informatics and Medicine. "If you had an idea, you could walk down the hall and work with DBMI colleagues who had the source code and could make it happen. When we moved to Epic, many worried that kind of innovation was no longer possible. VCLIC emerged as both bridge and catalyst, demonstrating that Vanderbilt could maintain its innovative edge within a commercial platform by creating new pathways for clinician engagement and system customization."

One key initiative out of VCLIC and VUMC's Department of Medicine is the eStar Physician Builder Program, led by Jonathan Wanderer, MD, MPhil. This program provides advanced training to providers with a desire to enhance Epic and its various functions — and gave clinicians the opportunity to tweak the EHR to suit the institution's needs.

"Technology and integrations are getting to the point where platforms like Epic are opening ways that we can make improvements to do better care," said Patel, who succeeded Johnson as chief health information officer in HealthIT following Johnson's departure in 2021. "It's slow work but we're turning a corner and beginning to see the next wave of cycles of improvement how teams interact with each other."

"It's fair to say that DBMI at Vanderbilt has gone from being the largest department in informatics, which doesn't necessarily convey its impact, to one of the strongest and functionally applicable departments in the world in informatics."

– KEVIN JOHNSON

DBMI and HealthIT's capabilities stepped up when the COVID-19 pandemic hit home in March 2020. Johnson and Patel played pivotal roles in helping VUMC navigate the pandemic by helping leadership push out telehealth appointments to patients across Tennessee. "Our ability to move information around to record and capture data, gain insights and quickly make decisions… we were able to deliver care to patients and get vaccines and the right protocols to employees," said Patel.

Johnson predicts a "bigger and brighter" future for the field of informatics. "All the ways it might happen, whether it's through mental health, prediction, home and mobile based technologies… Vanderbilt is positioned to be that."

"It's fair to say that DBMI at Vanderbilt has gone from being the largest department in informatics, which doesn't necessarily convey its impact, to one of the strongest and functionally applicable departments in the world in informatics," said Johnson. "Research, education and the examples of leadership coming out of the department that are key linchpin to the overall success of the field nationally and internationally."

"The collaboration between DBMI and HealthIT sets VUMC apart and makes us unique," said Dara Mize, MD, MS, current chief medical information officer at VUMC. "We have faculty and an operational IT group who work together to ensure we're delivering and leveraging the best technology solutions for patient care. This makes us magic, and I would like to see that continue. To me, that's the reason to work at Vanderbilt."

Innovating the future: Peter Embí

While the country was still reeling from the pandemic in 2021, DBMI leadership began their national search for its newest chair after Johnson announced his departure to join the University of Pennsylvania. Johnson hoped that his successor would be someone who could bridge all aspects of the research enterprise at VUMC, with informatics and HealthIT at the helm, and bring DBMI into nationwide conversations and collaborations.

That's where Peter Embí, President and Chief Executive Officer of the Regenstrief Institute in Indianapolis, came in. Embí joined as DBMI's newest chair and VUMC's inaugural senior vice president for Research and Innovation in January 2022. Fortunately, he was already familiar with DBMI's achievements.

He recalled visiting DBMI and its then-Chair, Masys, early in his career: "I remember sitting in his office and he said, 'One of the amazing things about this place is that we're writing code in the morning and taking care of patients in the afternoon.' That was simultaneously terrifying and exhilarating, but mostly exhilarating because I knew it was being done extremely well and very thoughtfully.

"A lot of my Vanderbilt colleagues were luminaries in the field who had been working for many years to advance what we do in biomedical informatics. So, the opportunity to come here and succeed Kevin, and be able to continue the momentum of growth of what is the best Department of Biomedical Informatics in the country, was a real privilege."

As senior vice president for Research and Innovation, he helped advance VUMC's research capabilities by establishing new research informatics roles for faculty and new centers in collaboration with different academic departments:

Paul Harris was appointed vice president for Research Informatics in June 2023.

Travis Osterman, DO, MS, assistant professor of Biomedical Informatics (DBMI), Hematology and Oncology and director of Cancer Clinical Informatics at Vanderbilt-Ingram Cancer Center, was appointed associate vice president of Research Informatics in March 2023.

Dara Mize, MD, MS, was named chief medical information officer in February 2023, and in August 2023, Osterman and Wanderer were named associate chief medical information officers.

In January 2024, VUMC established the Realizing Accelerated Progress, Investigation, Implementation, and Dissemination in Learning Health Systems (RAPID-LHS) Center to "minimize gaps between the generation of clinical evidence, implementation of proven interventions and development of informed public health policy." The center is led by Embí, Christianne Roumie, MD, MPH, and Russell Rothman, MD, MPP, and supported by a $5 million grant from the Agency for Healthcare Research and Quality and the Patient-Centered Outcomes Research Institute.

Embí came to VUMC with a strong passion for ethical care, specifically in AI and clinical trials.

Embí joined a National Academy of Medicine committee to produce a code of conduct for the development and use of artificial intelligence in health, medical care and health research.

In July 2022, Embí was responsible for VUMC's partnership with Yale School of Medicine and the Morehouse School of Medicine via the Equitable Breakthroughs in Medicine Development

Peter Embí joined as DBMI's chair in January 2022.
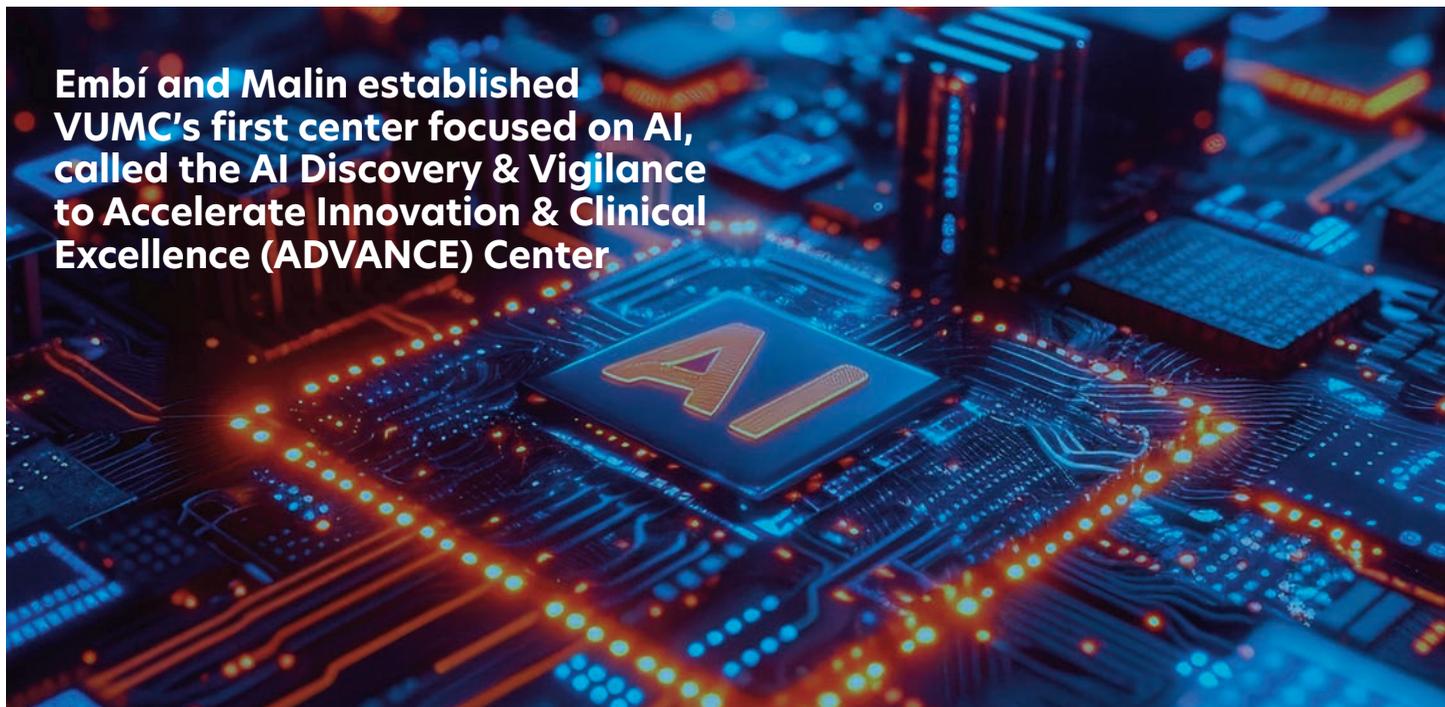
Embí and Malin established VUMC's first center focused on AI, called the AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence (ADVANCE) Center

(EQBMED), which aims to increase diversity in clinical trials and address systemic barriers to participation.

In November 2023, Embí and Laurie Novak, PhD, MHSA, were awarded funding from the Gordon and Betty Moore Foundation for the project "Measuring Artificial Intelligence (AI) Maturity in Healthcare Organizations."

In December 2023, Embí and a group of DBMI faculty received funding from the Augmented Intelligence in Medicine and Healthcare Initiative (AIM-HI) Coordinating Center at Kaiser Permanente for their project "Advancing Novel Approaches and Best Practices for Effective AI-Enabled Diagnosis using Randomized Trials, Algorithmovigilance, and Proactive Risk Assessment".

In March 2024, VUMC joined the new Trustworthy & Responsible AI Network (TRAIN) which is one of the first health AI networks aimed at operationalizing responsible AI principles to improve the quality, safety, and trustworthiness of AI in health.

In March 2024, Embí and Malin established VUMC's first center focused on AI, called the AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence (ADVANCE) Center, which earned VUMC a title as one of the nation's top health care systems for AI by Becker's Healthcare.

Together, they are working on how to build AI tools and machine learning models that are trustworthy and fair.

"Specifically, we have been working on tools to inject trust into large language models, such as those that serve as the basis of systems like ChatGPT," said Malin, co-director of the ADVANCE Center.

"To do so, we are building hallucination detection and mitigation mechanisms. Second, we are working on methods to create machine learning models that are fair in their performance for the various populations they are meant to support. One of the ways that we are doing so is through the creation of synthetic data that can be injected into machine learning models to help resolve disparities in the performance of the models."

Looking ahead

In May 2025, Embí stepped down from his role as chair to launch a new company built on innovations developed at VUMC to advance responsible healthcare AI and innovation. He is continuing his role as professor and holder of the endowed Directorship of Biomedical Informatics, as well as co-director of the ADVANCE Center, co-Director of the RAPID-Learning Health System Center, and co-Chair of the AI Technologies governance committee for VUMC.

"Leading this department has been one of the greatest privileges of my career," he said. "Together, we have continued to grow the Department of Biomedical Informatics into the leading program of its kind. I am incredibly proud of what we have achieved."

"Under Embí's direction, DBMI reached new heights. Peter brought energy and vision to the department's initiatives that will have a lasting impact. His contributions to our programs in artificial intelligence have us well positioned for the future as we seek to harness its full potential," said Jeff Balser, MD, PhD, President and CEO of VUMC and Dean of Vanderbilt University School of Medicine.

Under interim chair Josh Peterson, Embí is "confident that the department will continue to grow and succeed under his capable leadership."

The Department of Biomedical Informatics Through the Years

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1991

Bill Stead recruited from Duke University to Vanderbilt University as Associate Vice Chancellor for Health Affairs, begins forming the Informatics Center

1992

Bill Stead oversees the establishment of the VU Eskind Biomedical Library as the new "hub" for the Informatics Center

1993

The Division of Biomedical Informatics is formally established within the Division of the School of Medicine at VUMC by **Bill Stead**.

1994

Randy Miller is recruited to VUMC as Professor and Chair of the Division of Biomedical Informatics. Nunzia & Dario Giuse, Antoine Geissbuhler and Steven Brown join VU from the University of Pittsburgh.

2001

Division of Biomedical Informatics officially becomes a department at VUMC and hires more primary and secondary faculty in bioinformatics.

2002

DBMI Education program expands to three tracks: MS/PhD, MD-PhD, Postdoctoral Fellowship. **Kevin Johnson** joins as new Vice Chair of Biomedical Informatics

2004

Dan Masys appointed Chair of DBMI. My Health at Vanderbilt and REDCap founded

2007

BioVU is established

2012

Kevin Johnson named Chair of DBMI

2019

Center for Improving the Public's Health through Informatics within DBMI established. **Joshua Denny** selected to lead the *All of Us* Program

2022

Peter Embí joins as new Chair of DBMI

"A well-established leader in DBMI and our organization, Dr. Peterson continues to make substantial contributions to our programs in personalized medicine and is well prepared to serve as the department's interim chair. I want to thank him for his service," said Balser.

DBMI's future

There may be no single solution for improving health care for both patients and clinicians. But informaticians like those working at VUMC will continue to innovate and test tools that impact the field across the globe.

"DBMI takes a holistic approach to informatics," said Malin. "The faculty in the department have backgrounds that are highly diverse, ranging from hardcore computer scientists to anthropologists to clinical specialists that are looking to bring technology into the everyday practice of healthcare."

More importantly, the department is rooted in an ethos of collegiality. Teaming in the department happens regularly and is strongly encouraged, which is something that does not always happen in academia. Also, it's important to recognize that we are encouraged to study the data that the VUMC generates about patients and healthcare operations, as well test our ideas in pragmatic trials. As Bill Stead has repeatedly said, "we treat VUMC as a living laboratory."

"I have a ton of pride. It's been a great place to work over the years. Nationally, Vanderbilt's DBMI has really thrived and is fairly unique, and it's been great to watch DBMI become the leader that we set out to do 30 years ago," said Rosenbloom.

"I'm very proud and delighted with how the department has grown," said Stead. "You see the vibrance at the annual retreat. It's hard to remember a time when all the faculty fit at my dining room table! That's extraordinarily positive."

Josh Peterson named interim Chair in May 2025.
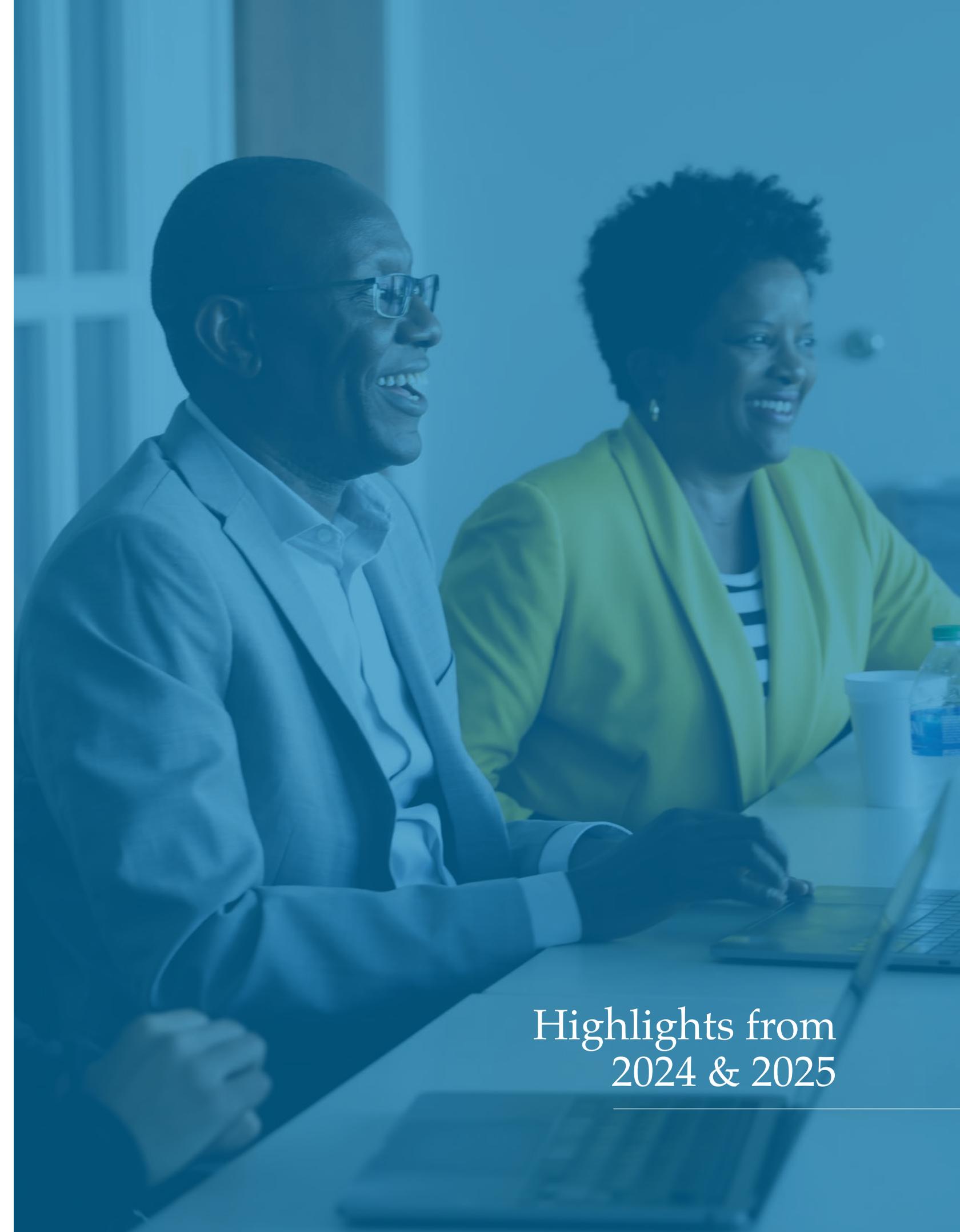
Highlights from
2024 & 2025

Specialized Team Working to Leverage Health AI

Vanderbilt University Medical Center has opened AD-VANCE, an informatics center focused on artificial intelligence (AI) that brings together clinicians, computational scientists and patients in a collaborative hub to improve clinical outcomes.

ADVANCE stands for "AI Discovery and Vigilance to Accelerate Innovation and Clinical Excellence" and made its debut March 2024 as part of the Department of Biomedical Informatics (DBMI).

The initiative aims to foster cross-departmental research and "represents a significant step forward in the evolution of AI applications in health care," said Peter Embí, MD, MS, professor of Biomedical Informatics at Vanderbilt. Embí co-directs AD-VANCE along with Bradley Malin, PhD, vice chair for research affairs in the department.

"It is important to have a group of experts that understand the capabilities and limitations of AI to avoid getting caught up in the hype," Malin said. "ADVANCE brings these experts together under one roof."

Encouraging Wide Collaboration

According to Malin, the center integrates frontline health care workers, researchers and computational scientists in efforts to address complex challenges and drive transformative innovations.

"We're encouraging experts from all departments to bring their ideas forward," Malin explained.

In organized studio sessions, these teams will discuss and refine their ideas. Ongoing communication across disciplines is essential to grasp the full potential of new projects, Malin said. As more experts join in, he anticipates such sessions will become regular occurrences at the center.

Additionally, Embí and Malin will be asking patients and community members to participate to determine their attitudes toward new technologies and willingness to adopt them.

Embracing Co-Creation

Malin notes that one of the center's unique features is co-creation. The co-creation process entails identifying key stakeholders, understanding their preferences, and actively involving them in the technology development process.

Co-creation is known to enhance creativity and innovation, speed up development cycles and improve decision-making, he explained.

"People engage with something they have a stake in," Malin said. "Our goal is to engage a diverse group of stakeholders in the technology development process."

Malin believes that AI technologies should be used to address real-world issues, that the co-creation process is well suited to this role.

"We must make sure that AI is utilized for the betterment of humanity," he said.

Lessons Learned So Far

In launching the center, Malin said both he and Embí encountered many learning opportunities. Among the lessons: AI is a tool, not a solution in its own right.

Another has been the importance of gathering feedback from end users. He said gaps can exist between expert computational science models and the user experience.

"Design your technology based on the problems it aims to solve," Malin said. "Developing technology for an existing user base is straightforward, but gaining patient trust is a whole different challenge."

Furthermore, Malin advises organizations to refrain from overspecializing their workforce. He sees the key to long-term success as having generalized computational expertise to seamlessly transition between projects as they evolve.

"It is important to have a group of experts that understand the capabilities and limitations of AI to avoid getting caught up in the hype."

– BRADLEY MALIN, PHD

"ADVANCE" SYMPOSIUMS EXPLORE TRANSLATING AI INTO PRACTICE & IMPORTANCE OF PATIENT VOICES IN SUCCESS OF AI IN HEALTH CARE

Since its launch in March 2024, the AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence (ADVANCE) Center has sponsored two symposiums exploring critical topics in the field of artificial intelligence.

The themes of the events were "Translating AI into Practice" (Oct. 8-9, 2025) and "The Future of Healthcare: Bridging AI Research and Human-Centered Solutions" (Nov. 5-6, 2024), respectively.

During the ADVANCE Fall 2025 symposium, VUMC experts served on panels devoted to AI broad basics, AI at the research bench, AI at the bedside, AI for the future, AI governance and monitoring, and AI lessons learned. Two important leaders delivered keynote talks:

Philip Payne, PhD, director of the Institute for Informatics, Data Science and Biostatistics and chief health AI officer at BJC Health System and WashU Medicine, as part of Washington University in St. Louis, delivered a talk with the title "From Overload to Insight: AI's Role in Elevating Human Attention in Biomedicine." Kedar Mate, MD, co-founder and chief medical officer of Qualified Health, a generative AI company, delivered a talk with the title "Climbing a Mountain: Lessons on Scaling Innovations to Deliver on AI's Promise."

One of the take-home messages of the ADVANCE Fall 2024 symposium was that AI is transforming the world, but it won't fulfill its promise to make life better for everyone unless users, consumers and patients have a say in how it's wielded.

"There are many people who are suffering and not getting the care they need," said Peter Embí, MD, MS, professor of Biomedical Informatics who co-hosted the event. "We need to address that. A big part of that will come from the work we're doing in AI."

The program concluded with a VUMC Discovery Lecture by Microsoft chief scientific officer Eric Horvitz, MD, PhD.

Horvitz traced the explosive evolution of large language models, including OpenAI's GPT series, from the generation of human-like conversational responses to users' questions, to a multimodal model that incorporates images as well as text.

The latest iterations include OpenAI's o1, which tackles complex reasoning tasks by first generating long "chains of thought," and a virtual research assistant built by Horvitz and his colleagues that reviews the scientific literature before proposing experiments to solve a problem.

"Further development in human-computer interactions is needed to realize the potential of these systems in clinical decision support," Horvitz noted. "How might we harness this technology, which is almost like magic, for human flourishing?"

That's a question dozens of researchers and clinicians involved in AI at VUMC are determined to answer.

ADVANCE co-directors Embí and Bradley Malin, PhD, and their colleagues have helped to position VUMC and the DBMI as international leaders in the development, implementation and evaluation of advanced data analytics, machine learning, predictive modeling, generative AI and other novel and impactful technologies.

Through the ADVANCE center, they are partnering in highly collaborative ways with a diverse group of stakeholders to accelerate biomedical discovery and improve clinical efficiency and outcomes for patients.

Examples cited during the symposium included the use of AI to distinguish subtypes of asthma requiring different treatments, to abstract data used in research more efficiently from the electronic health record, and to rapidly determine whether a child has a rare disease.

Malin predicts that AI will help humans work more efficiently and effectively, but it won't replace them. And while he said there is a risk that AI will have unexpected and potentially harmful effects, "I think we're going to be a lot smarter in what we're doing."

An important part of this effort is VUMC's AI Patient and Family Advisory Group, which was established by ADVANCE executive director Susannah Rose, MSSW, PhD, and deputy director Laurie Novak, PhD, MHSA, both associate professors of DBMI.

The group works to ensure that the concerns, viewpoints and voices of patients and their families are meaningfully integrated into the development and deployment of AI into VUMC polices, operations and research initiatives.

"Anything less than knowing as much about patients as they know about themselves is going to leave you short," said advisory group co-chair Donald Thielemann. "Get them up front. Have them at your shoulder as you're doing the work. It will pay dividends for all stakeholders and, most importantly, patients."

It will take more than AI to fix long-standing societal problems that contribute to the high cost and uneven access to clinical care in this country. Yet that doesn't mean health care providers should accept the status quo.

"We have a huge obligation," said Jeffrey Upperman, MD, professor and chair of Pediatric Surgery, and Surgeon-in-Chief at Monroe Carell Jr. Children's Hospital at Vanderbilt. "We need to engage our colleagues, our patients and our families in these really important conversations.

"I do not want retreat," Upperman said. "I want you on that cutting edge. Ask the hard questions and be willing to deal with the answers you get."

AI advances work in VUMC's clinical and research settings

Vanderbilt University Medical Center (VUMC) physicians and researchers are applying artificial intelligence (AI) in innovative ways to advance clinical care and scientific understanding of these cutting-edge tools. Some examples of the use of AI are included here but other new examples are being developed and tested.

VUMC recently began testing AI for assisting health care documentation with a 10-physician pilot involving a system called DAX Copilot, from Nuance, a Microsoft subsidiary.

DAX Copilot is an AI-powered, voice-enabled system designed to automate the creation of clinical notes. The program listens to patient encounters and leverages generative AI to generate real-time, comprehensive clinic visit notes with appropriate headings and context. These notes are then made available immediately for clinician review and editing, integrating directly into VUMC's electronic health record system.

A key aspect of AI-assisted documentation is its potential to alleviate physician burnout while improving patient interactions, said the leader spearheading the pilot, Dara Mize, MD, MS, assistant professor of Biomedical Informatics and Medicine and Chief Medical Information Officer for VUMC.

"Generative AI shows promise in improving both the quality and efficiency of health care documentation."

– DARA MIZE, MD, MS

"Generative AI shows promise in improving both the quality and efficiency of health care documentation. The upcoming pilot marks a significant step in VUMC's exploration of AI's potential in streamlining clinician workflows and enhancing medical record-keeping while reducing time spent on documentation," Mize said.

The initial pilot will involve physicians from the Division of General Internal Medicine and Public Health and the Department of Orthopaedic Surgery. The Medical Center may evaluate additional AI-powered documentation assistants, Mize said, and these tests could expand to involve faculty in other divisions and departments.

"This continues VUMC's commitment to identifying and integrating leading health care technologies for quality, safety, and an enhanced patient/provider experience," Mize said.

For research, VUMC has created a version of OpenAI's large language model which is deployed inside of VUMC's Azure tenant and is available to VUMC's researchers. The VUMC-hosted graphical user interface (GUI) supports common prompt and response features.

Researchers can experiment using this interface as an alternative to the public version of ChatGPT which is disabled on VUMC's networks. The Chat playground provides more controls than the public chat interface from OpenAI.

Unlike the public version of ChatGPT, VUMC retains control over all data submitted to aiChat. aiChat is HIPAA certified and its use is covered under VUMC's Business Associates Agreement with Microsoft.

"Health IT worked closely with leaders in the Department of Biomedical Informatics to create a platform for the VUMC community to safely explore large language models," said Travis Osterman, DO, MS, Associate Vice President for Research Informatics and associate chief medical information officer for VUMC.

To learn more about other AI tools at VUMC, contact ai@vumc.org.

Dara Mize, MD, MS is spearheading an AI-assisted documentation pilot.

Becker's names VUMC a leading health system in AI ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛ ✛

Vanderbilt University Medical Center was recognized thanks to the leadership of Vanderbilt's Department of Biomedical Informatics and its new AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence.

In September 2024, VUMC was named a leading health system in the field of artificial intelligence (AI), according to Becker's Healthcare.

According to a list compiled by Becker's Healthcare and the Joan and Irwin Jacobs Center for Health Innovation at the University of California San Diego, VUMC was cited as one of 11 health systems pioneering "demonstrated, outcomes-based AI solutions" thanks to the leadership of Vanderbilt's Department of Biomedical Informatics (DBMI) and its new AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence (ADVANCE) Center.

"AI holds great promise for improving health and health care at a time when such improvements are sorely needed," said Peter Embí, MD, MS, professor of Biomedical Informatics and co-director of ADVANCE. "We feel it's the responsibility of institutions like ours to lead in demonstrating how Health AI innovations can benefit our patients and communities and ensure that we do so responsibly and equitably. This is what drives us."

"It is truly an honor to see our multidisciplinary approach to AI development, implementation and evaluation is being recognized at a national scale," said Bradley Malin, PhD, Accenture Professor of Biomedical Informatics, Biostatistics and Computer Science, vice chair for Research Affairs in DBMI and co-director of ADVANCE. "We look forward to continuing to lead in this space and changing the face of health care."

New evaluation system to render AI chatbots safe, empathetic

V-CARES will focus on detecting hallucinations, omissions and misaligned values in AI-generated responses on critical health topics.

The public's use of artificial intelligence (AI) chatbots for health care information continues to grow amid a welter of questions about their accuracy, safety and reliability and excitement over their potential to improve access to care.

A team at Vanderbilt University Medical Center will address the concerns and hopes surrounding health-related AI chatbots with the aid of a two-year funding award of up to $7.3 million from the Advanced Research Projects Agency for Health (ARPA-H).

ARPA-H, established in 2022, is an agency within the U.S. Department of Health and Human Services that supports transformative high-risk, high-reward research to drive biomedical and health breakthroughs to benefit everyone.

Led by principal investigator Susannah Rose, MSSW, PhD, associate professor of Biomedical Informatics, and co-principal investigator Zhijun Yin, PhD, MS, assistant professor of Biomedical Informatics and Computer Science, the team will build the Vanderbilt Chatbot Accuracy and Reliability Evaluation System (V-CARES). Using mental health as a demonstration case, the system will focus on detecting hallucinations, omissions and misaligned values, ensuring safety and empathy in AI-generated responses on critical health topics.

"We chose screening and treatment for major depression and generalized anxiety disorder because, from a safety and reliability standpoint, these chatbots pose a number of lingering challenges and unresolved questions," said Rose, a core faculty member in the Center for Biomedical Ethics and Society and executive director of the AI Discovery & Vigilance to Accelerate Innovation & Clinical Excellence (ADVANCE) Center at VUMC.

"In tackling this sensitive category of chatbot, V-CARES looks to furnish recommendations broadly applicable to the evaluation of chatbots across health care, and to do it in a way that is ethical and applicable to diverse populations."

The project will combine human expertise with advanced computational techniques. Along the way, the team will engage patients and clinicians, develop comprehensive knowledge bases, and deploy state-of-the-art machine learning.

"We will pursue a novel multiexpert ensemble learning framework," Yin said, "integrating various AI models and human expertise to achieve accurate detection of potential issues in chatbot responses."

A key aspect of the research involves ensuring that the evaluation system addresses the concerns and values of diverse stakeholders.

"By incorporating community members, patients and clinicians throughout the process, we aim to create a system that not only improves technical accuracy but also aligns with users' diverse values and expectations," Rose said.

The project team brings together researchers with expertise in computer science, biomedical informatics, anthropology, bioethics, clinical psychology, psychiatry, social work and behavioral economics.

"Research like this is essential to developing AI solutions that effectively serve patients and health systems, and to provide the evidence needed to build and deploy systems that people can trust and rely upon in practice," said project team member Peter Embí, MD, MS, professor of Biomedical Informatics and co-director of the ADVANCE Center.

"This project is also a prime example of the multidisciplinary and cross-sector work that is central to our center's mission."

Other Vanderbilt researchers on the project include Laurie Novak, PhD, MHSA, Shelagh Mulvaney, PhD, Siru Liu, PhD, Bryan Steitz, PhD, Bradley Malin, PhD, and Keith Meador, MD, MPH. They are joined by Murat Kantarcioglu, PhD, from Virginia Tech in Blacksburg, Virginia, and Christopher Symons, PhD, MSc, and Amy Bucher, PhD, from Lirio, Inc., a Tennessee-based tech company combining AI innovation with behavioral science to improve health outcomes.

Susannah Rose, PhD speaking about AI research in healthcare.

DBMI AI UP-AND-COMERS + + + + + + + + + + + + + + + + + +

Below is a list of members in Vanderbilt's Department of Biomedical Informatics who are currently making advances in the field of artificial intelligence!

Katie Brown — Optimizing LLMs as Clinical Prediction Models; Optimizing Clinical AI for Rural US Healthcare; Human-AI Collaboration

You Chen — AI in pharmacogenomics, neurodegeneration, and healthcare process optimization

Daniel Fabbri — AI-driven chart abstraction

Yaa Kumah-Crystal — AI Epic workflow integrations; inbasket draft replies; DAX ambient; AI voice agents

Siru Liu — Developing and evaluating a multi-agent system to optimize clinical order sets

Cathy Shyr — AI-assisted rare disease diagnosis

Colin Walsh — AI and suicide prediction

Wei-Qi Wei — AI-driven Phenotyping System

Chao Yan — Synthetic health data generation; LLM-based disease diagnosis and phenotyping; Trustworthy pathology AI; Graph-based drug repurposing

Zhijun Yin — Social Computing for Health and Wellbeing; Multimodal AI for Cancer Prevention; Deep Genomics

VANDERBILT STUDENTS HONORED AT AMIA 2024

Three students within the Department of Biomedical Informatics (DBMI) at Vanderbilt University Medical Center were awarded top honors at the American Medical Informatics Association (AMIA) 2024 Annual Symposium, held this year in November in San Francisco.

Victor Borza, MD, PhD student, and Uday Suresh, PhD student, were selected as finalists for the AMIA 2024 Student Paper Competition for their papers titled "Adaptive Recruitment Resource Allocation to Improve Cohort Representativeness in Participatory Biomedical Datasets" and "Behavior Shifts in Patient Portal Usage During and After Policy Changes Around Test Result Delivery and Notification", respectively.

Borza won first place in the competition, receiving the Martin Epstein Award at AMIA 2024.

"I'm honored to win the Martin Epstein Award this year, especially among such strong competition. I owe immense gratitude to my advisor, Brad Malin, and to my other co-authors for their guidance and support throughout the research process," Borza said. "Also, a huge thank you goes to Jes-

sica Ancker for giving me feedback on the final manuscript."

"This award is very prestigious. It's considered to be an indicator of who the up and comers in the field are," said Bradley Malin, PhD, Accenture Professor of Biomedical Informatics, Biostatistics, vice chair for Research Affairs in DBMI, and co-director of the AI Discovery and Vigilance to Accelerate Innovation and Clinical Excellence Center.

The AMIA student paper competition honors research conducted by students in informatics programs nationwide. This year, the competition included eight judges and more than 60 papers that were accepted from various academic institutions. After deliberation, eight finalists were selected and asked to present their work in a session during the conference. After the presentations, the top three

winners were selected.

Borza is the fourth DBMI winner of the AMIA student paper competition since 1983, following Sharon Davis, PhD, MS, in 2019, Elizabeth Ashley Durham, PhD, in 2010, and Yin Aphinyanaphongs, MD, PhD, in 2003. This is Suresh's second year in a row being named a finalist.

Finally, Marco Barbero Mota, PhD student, received second place at the Knowledge Discovery and Data Mining Working Group Innovation Competition for his paper titled "A data-driven approach to discover and quantify systemic lupus erythematosus etiological heterogeneity from electronic health records."

Survey Finds Patients Value Immediate Access to Test Results

In March 2023, several faculty in the Department of Biomedical Informatics at Vanderbilt University Medical Center, as well as researchers in clinical informatics, medicine, pediatrics, biostatistics, ophthalmology, and emergency medicine across the US, published a striking study that found that patients supported immediately receiving their test results via a patient portal.

A survey sent to more than 43,000 patients living in several states around the country found that 96% of patients who use patient web portals prefer immediate online access to their clinical test results, notwithstanding the prospect of reviewing results before their physicians have a chance to review them. Led by researchers at VUMC, the survey was reported March 20, 2023, in *JAMA Network Open*.

"After reviewing our findings, I was surprised to see that the overwhelming majority of respondents wanted to see their re-

sults as soon as they were available, even if that meant that the clinician had not yet had time to review the result," said Bryan Steitz, PhD, Assistant Professor in DBMI, and leader of the study.

Why Does This Matter?

It used to be common for doctors and hospitals to delay or block altogether certain test results from patient portals, especially those subject to misinterpretation or apt to cause emotional distress. Under a federal rule in effect since April 2021, called the 21st Century Cures Act Final Rule, patients, upon their request and at no cost, must be given electronic access to their clinical notes and other health information kept by hospitals and doctors. This includes, with very few exceptions, immediate access to any clinical test results. The moment doctors can see new results on their computer screens and smart phones,

1 ▬▬▬▬▬▬▬ 76
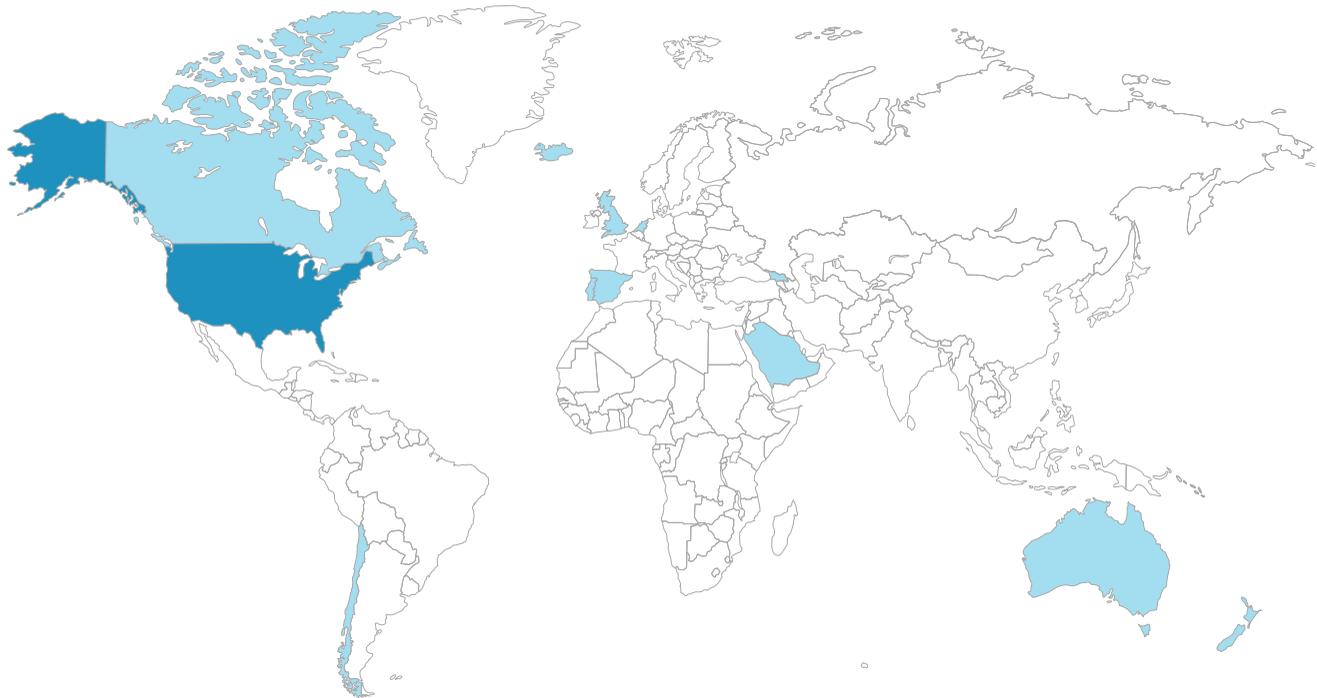
GEOGRAPHICAL BREAKDOWN

Country	Count	As%
United States	76	28%
Canada	11	4%
Spain	4	1%
Australia	3	1%

DEMOGRAPHIC BREAKDOWN

Country	Count	As%
Members of the public	159	59%
Scientists	65	24%
Practitioners (doctors, other healthcare professionals)	38	14%
Science communicators (journalists, bloggers, editors)	9	3%
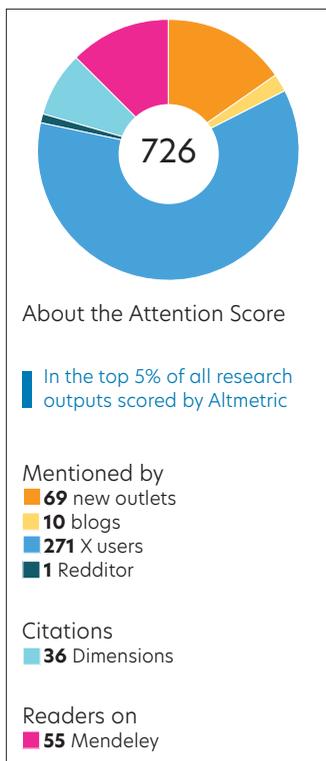
over the internet their patients can too, if they wish. (At VUMC, patient access to the health record is primarily provided through the My Health at Vanderbilt patient web portal.)

The team's early work found that patients now review 40% of results previously identified as sensitive before their clinicians. "For many test results, this is innocuous and provides patients an opportunity to better engage in their health and health care," Steitz explained. "However, releasing sensitive or easily misinterpreted results without context provided by clinician remained controversial and raised concerns of undue emotional distress on patients."

Steitz states that there is much ongoing work to improve result release for patients and providers. "I'm particularly excited about our work to understand the nuances around these patient preferences, especially when results may be lifechanging such as a new cancer diagnosis, and developing solutions that support patients throughout result ordering and review."

"As a clinician, many of us have had to adapt our practice," said Travis Osterman, DO, MS, associate professor of Biomedical Informatics and Medicine, associate vice president for Research Informatics, and associate chief medical information officer at VUMC and director of Cancer Clinical Informatics at the Vanderbilt-Ingram Cancer Center.

Osterman, who was not part of the study, shared that he now advises patients and their families to contact him as soon as they review their test results and to schedule an appointment soon afterwards to discuss in-person. "For example, pediatric oncology is tough. It's very scary to find results on a Friday and not have an appointment until Monday. I've come full circle on this. After having done this with patients, the benefits far exceed it from an ethical perspective. Patients deserve their results."

Steitz & Team Score Big on Altemetric!

Altmetric is a score that tracks the attention an article receives online – including mentions in the news and blogs, Twitter posts, and citations. The team's Altmetric suggests that the attention this article received was in the top 5% of research articles all-time and in the 99th percentile among research of the same age!

"This work is among the first and largest studies to assess patient perceptions of receiving immediately available test results and has been widely cited by news organizations, policy makers, and in recent scholarly publications," said Steitz.

$3.4 million research grant targets risk of heart attack, stroke

There's a critical gap in cardiovascular health: patients regularly have heart attacks or strokes despite receiving treatments to lower their cholesterol and blood pressure.

Wei-Qi Wei, MD, PhD, associate professor of Biomedical Informatics at Vanderbilt University Medical Center, was awarded a four-year, $3.4 million research grant from the National Institutes of Health to study this residual risk of atherosclerotic cardiovascular disease (ASCVD) and identify any existing drugs that might help lower this risk.

"Our goal is to uncover the underlying mechanisms of residual ASCVD risk, identify patients at higher risk, and explore new treatment options," Wei said. "By leveraging advanced genetic and data science techniques, we hope to make significant strides in reducing the burden of cardiovascular disease."

The project will begin with Vanderbilt's DNA biobank, BioVU, where a genome-wide association study (GWAS) will compare patients who do, and do not, experience ASCVD events while on preventive treatment. The team will meanwhile conduct machine learning on electronic health records (EHR) to predict residual ASCVD risk.

These initial steps will produce polygenic risk scores for residual risk and better automated EHR risk stratification, with results subject to validation in two national biobanks, eMERGE and All of Us.

Genetic risk variants found in GWAS will also be used to impute the transcriptome and overall gene expression pattern characteristic of residual ASCVD risk. These data, combined with a method called Mendelian randomization, will power an efficient search for drug repurposing candidates, with results again to be validated using national patient databases.

Wei is scientific director for the phenotyping core at VUMC's Center for Precision Medicine. Some of the concepts and methods driving this new project have been pioneered and refined by Wei and his team.

Co-leading the effort with Wei will be Qiping Feng, PhD, associate professor of Medicine in the Division of Clinical Pharmacology. The project is supported by NIH grant R01HL171809.

Wei-Qi Wei, MD, PhD

Presidential Awards Recognize Early Career Researchers

The award is the highest honor bestowed by the U.S. government on scientists and engineers in the early stages of their research careers. In the final days of the Biden administration, six Vanderbilt faculty members (three of whom are members of the Department of Biomedical Informatics) were among nearly 400 researchers to receive the Presidential Early Career Award for Scientists and Engineers (PECASE). Established in 1996, the award is billed by the White House as the highest honor bestowed by the U.S. government on outstanding scientists and engineers in the early stages of their independent research careers.

Each year, with the White House Office of Science and Technology Policy coordinating with participating federal departments and agencies, the awards program typically recognizes around 100 researchers; the Biden White House had not given the awards in previous years, with the consequence that this year's PECASE count is exceptionally high.

"Congratulations to these six faculty members from across Vanderbilt on having been selected by President Biden for this outstanding award. We're so proud of them and their accomplishments and excited by all that lies ahead for their research teams," said Jennifer Pietenpol, PhD, Executive Vice President for Research, and chief scientific and strategy officer for Vanderbilt University Medical Center.

Jessica Ancker, PhD, MPH, professor of Biomedical Informatics: Ancker's research centers on the optimal use of information and information technology to improve health care decision-making. Her focus includes health numeracy and data communication, human factors in clinical decision support, and health services research, especially the effect of health information technologies on health care quality. Programs include synthesizing evidence about how to present health-related data to patients, and examination of the effect of the abrupt transition to telehealth at the beginning of the COVID-19 pandemic.

You Chen, PhD, associate professor of Biomedical Informatics: Chen's research is broadly concerned with opportunities to optimize health care processes. His research foci include medical data mining and machine learning, natural language processing, multi-site transfer learning, clinical workflow, care team identification, disease progression path modeling, predictive analytics, disease profiling and personalized medicine, hospital readmission and patient length of stay analytics, and health information security and privacy.

Eric Tkaczyk, MD, PhD, associate professor of Dermatology and Biomedical Informatics: From a base in biophotonics for diagnosis and treatment of skin diseases, Tkaczyk's research seeks to integrate patient care, clinical investigation and technology with applications in dermatology, oncology, hematology and other specialties. Among his research specialties are noninvasive diagnostic technology, 3D imaging, machine learning, artificial intelligence and deep learning.

DBMI's past PECASE awardee includes Bradley Malin, PhD.

Faculty News &
Education Highlights

Education Highlights and Advancements

Vanderbilt's MS and PhD in Biomedical Informatics Program

The research PhD and MS program continues to be a point of pride for DBMI. We awarded five doctorates and four master's degrees in biomedical informatics in the past 12 months from January 2024 through January 2025, with graduates entering jobs in academia, governmental service, and industry. We continue to be grateful for the National Library of Medicine for funding our T15 training grant, which provides support to many of our students.

This year was another incredible year for student and trainee accomplishments and awards. The capabilities of our extraordinary students and trainees were particularly on display at the American Medical Informatics Association (AMIA) 2024! Congratulations again to Victor Borza on being named the first-place winner of the Martin Epstein Award from the AMIA 2024 student competition (a HUGE honor in the informatics field) and to Uday Suresh for being named an AMIA student paper competition finalist for a second year in a row! Congratulations as well to Marco Barbero Mota who received second place at the AMIA 2024 Knowledge Discovery and Data Mining Working Group Innovation Competition.

We also completed a year-long curricular redesign initiative for the PhD/MS program, led by Sharon Davis, PhD, MS, Assistant Professor in DBMI, and a subset of faculty and students from the Curriculum Committee. The updated and streamlined curriculum was launched for first-year students in fall 2024.

Congratulations to our 2024 graduates on successfully defending their dissertations and theses!

PhD Students

Monika Grabowska
6/30/2025

John Shelley
6/30/2025

Ioana Danciu
12/14/2024

Barrett Jones
5/10/2024

Kevin Krause
12/13/2025

Thomas Brown
5/10/2024

Bryan Glazer
12/14/2024

Leigh Anne Tang
12/14/2024

MS Students

Victor Borza
8/9/2024

Brian Douthit
12/14/2024

Samuel Jean-Baptiste
8/9/2024

Joseph Vento
8/9/2024

Master of Science in Applied Clinical Informatics (MS-ACI) Program

Our Master of Science in Applied Clinical Informatics (MS-ACI) program provides applied clinical informatics training for a diverse range of health care professionals. Working health professionals across the country, including physicians, nurses, pharmacists, program managers, research staff and more, can gain critical informatics and health IT knowledge—all remotely and within 21 months!

In January 2025, the MS-ACI program achieved accreditation by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). CAHIIM monitors educational quality in health informatics, health informatics management, and health science degree programs nationwide.

"Earning CAHIIM accreditation is a significant achievement for our MS-ACI program," said Program Director Scott Nelson, PharmD, MS. "It signifies our adherence to the highest standards of education, ensuring that our curriculum aligns with the rigorous requirements set forth by CAHIIM and incorporates the American Informatics Association (AMIA) core competencies."

One of only 31 master's programs to receive CAHIIM health informatics accreditation, this prestigious recognition underscores Vanderbilt MS-ACI's commitment to excellence in health informatics education and its alignment with industry-leading standards. The program will remain accredited for the next seven years and will undergo continuous review for accreditation going forward.

2024 Graduating Class Capstone Projects +

Jay Patel, PharmD, MS
Developed a chatbot using a retrieval augmented generation (RAG) framework to answer drug information questions.

Eric Brown, MD, PhD, MS
Built structured optic nerve OCT interpretations in Epic.

Adam Broslat, MS
Implemented a Virtual Nursing Care Model, introducing technology-driven efficiencies.

Julie Bauml, MD, MS
Built custom forms and other enhancements in Epic to streamline radiology imaging protocols.

Nick Goldsmith, PharmD, MHSA, MS
Built a process to synchronize medication frequencies across the EHR and automated dispensing systems, enhancing patient safety.

Hanna Semega, PharmD, MBA, MS
Researched how automated dispensing system alerts are designed across different health systems.

2025 Graduating Class Capstone Projects +

Jacob Franklin, MD
Evaluated ambient documentation technology with DAX Copilot

Jeremy Hutchinson, PharmD
Developed a database for oral anti-cancer therapy.

Scott Gregory, MD, MBA
Streamlined Merit Based Incentive Payments System (MIPS) reporting requirements for his pathology group.

Layth Qassem, PharmD
Integrated genomic analysis and machine learning in a unified graphical user interface platform for antimicrobial resistance.

Ali Duarte-Garcia, MD, MSc
Streamlined managing autoimmune diseases monitoring process by integrating automation technologies at the Mayo Clinic Rochester.

Derek Baughman, MD
Developed the CigStopper tool to facilitate tobacco cessation counseling and medical billing processes by integrating national language processing and machine learning tools into clinical workflows.

The Shining Soul of DBMI: Rischelle Jenkins

When students in Vanderbilt's Biomedical Informatics program complete capstone presentations and doctoral dissertations, by custom they include a slide of thanks to those who have helped them achieve that level of success. The names vary, of course, based on the course of study and the involved faculty members, but they all include one name: Rischelle Jenkins.

"Having been to so many student defenses over the years, Rischelle is included in the acknowledgment slides of almost every single student," said Kim Unertl, PhD, director of Graduate Studies, associate professor of Biomedical Informatics and former MS and PhD student in the Department of Biomedical Informatics (DBMI). "I can't think of any student who hasn't included her."

Jenkins is the program manager of the Master's and PhD program in DBMI, but "program manager" doesn't say nearly enough. One of her students had another name for it: "University Mom."

Jenkins has been the first point of contact for Vanderbilt informatics students since she joined DBMI on March 1, 2001.

"I've always called the students my babies even though they're adults," she says with a laugh.

"Whether I'm at the office or working from home, people are always welcome to contact me any time. I'm here because of the students."

Wearing many hats

It's not just the students, though. Faculty, staff and department leadership rely on her, too.

Over her two decades in the department, Jenkins has worked alongside the program's educational leadership, managing student recruitment and enrollment, organizing critical data for DBMI's National Library of Medicine grant, budgeting, overseeing weekly informatics seminars and planning social activities for students.

DBMI staff and former students-turned-faculty commonly chat with Rischelle in the hallways, sharing details about their weddings, children, and elderly parents' wellbeing. And at the American Medical Informatics Association (AMIA) Symposiums, the largest annual informatics conference, DBMI alumni, graduates from the AMIA High School Scholars Program and Vanderbilt Biomedical Informatics Summer Program, and even applicants who didn't participate in Vanderbilt's informatics programs regularly stop by VU's booth to say hello.

"When you're applying to grad school, you're in a disconnected place. You don't know much about the institution," Unertl said. "Rischelle helps applicants navigate that. She's an important friendly face and a welcoming presence for people."

"I want to be that person that gives them warmth and love and makes them feel comfortable," Jenkins said.

The spirit and soul of the department

In 2024, Jenkins celebrated her 40th work anniversary at Vanderbilt. Her first job was in Management Systems, and she moved through several areas, growing in administrative skills and knowledge. This included working in the Center for the Advanced Study of Educational Leadership at VU's Peabody College as the secretary to the director, Philip Hallinger.

"Dr. Hallinger empowered and encouraged me in so many different aspects professionally that I'll always be grateful for," she said.

Even though she left that role in 1994, Hallinger, who is at the College of Management at Mahidol University in Thailand, and Jenkins still regularly check in with each other.

"Rischelle is still helping me after all these years!" he said.

For her 40th anniversary at Vanderbilt, her DBMI colleagues found various ways to show their love and support, including attending a special program at the Bishop Joseph Johnson Black Cultural Center to celebrate Black employees who have been with the institution for more than 25 years, and also a special recognition and reception in her honor.

"To say it has been a pleasure to work with Rischelle is an understatement," says Peter Embi, MD, MS, Professor of Biomedical Informatics and Medicine and past chair of Biomedical Informatics at VUMC.

Rischelle Jenkins, program manager of the Master's and PhD program in DBMI, recently celebrated her 40th year anniversary at Vanderbilt.

"Rischelle embodies the spirit and soul of the department and is always focused on making sure that everyone in DBMI and everyone we interact with has an outstanding experience. She's an amazing colleague, friend, and ambassador for DBMI, and we are so fortunate to have benefitted from her service for so many years."

"Someone with her level of experience and fantastic skills — and generally being so great to be with — she can get a job anywhere, and she's chosen to be here for a long time," said Jessica Ancker, PhD, MPH, professor of Biomedical Informatics and Health Policy and vice chair for Educational Affairs in DBMI. "I want to make sure we value that. It's a true gift.

"Rischelle became the repository of institutional knowledge, and that was completely critical," said Ancker, whose first task upon joining DBMI in January 2021 was to write the department's T15 grant renewal. "We couldn't have done that without her."

Moving forward

Jenkins is also credited with helping Unertl and Neil Sarkar, PhD, MLIS, establish the AMIA High School Scholars Program, which has introduced high school students to informatics since 2014 and provided opportunities for them to present research at the AMIA Annual Symposium.

"It's eye-opening for these kids to see informatics as a potential profession," said Sarkar, President and CEO of the Rhode Island Quality Institute and associate professor of Medical Science and Health Services, Policy and Practice at Brown University. "This has been a wonderful partnership with Kim Unertl from the very beginning. We've built something that will leave a legacy, and none of it would be possible without Rischelle."

Jenkins looks back at her career and is grateful that so many people in and outside of Vanderbilt have recognized her reputation as a hard worker and loving person.

"Remembering 'to do unto others as you would have others do unto you,' or not 'to return evil for evil,' those are the things I work hard to live by," she said.

"I didn't have to go outside of Vanderbilt to advance," Jenkins said. "I was able to do my 40 years right here. I'm here now because of the growth I've done over the years, and because of the great mentors in my life who have taken an interest in my professional development. For that, I'm deeply grateful."

"Caring for the whole person": Rischelle Jenkins' colleagues speak

+ +

Since coming to DBMI in 2001, Jenkins has been the consistent thread as the program and its leadership changed over the years, her colleagues, past and present, agree:

"As the program grew, Rischelle was the center point between students, faculty and the degree program organization. She had an impeccable ability to maintain a smile and warmth no matter what was thrown at her." — **Dominik Aronsky,** *MD, PhD, former director of the MS/PhD program, and currently Chief Medical Information Officer of Semedy in Switzerland.*

"The cornerstone to making a good program great is that kind of resilience and getting the 'right people on the bus'. Rischelle is one of those people. What she brings are the qualities that allow busy academics to hand off tasks to a program manager and know that she will always make you look good and the make the program excellent." — **Kevin Johnson,** *MD, MS, the former chair of DBMI and now David L. Cohen University Professor of Pediatrics, Biomedical Informatics, and Science Communication at the University of Pennsylvania.*

"From the beginning, we always wanted our program to educate the whole person and that starts with caring for the whole person. You must extend energy and effort to know and care for individual students so that you can help them meet their educational goals. Rischelle brought that to the program as it wasn't just a philosophy for her – she lives that every day." — **Cynthia Gadd,** *PhD, MBA, MS, Professor Emerita of Biomedical Informatics and former Vice Chair for Educational Affairs at VUMC.*

"Rischelle exudes so much positivity and it is truly contagious. Even as my roles have changed, I still find myself turning to Rischelle for advice, and I'm so lucky that she is incredibly generous with her time and wisdom. And I cannot think of a room that Rischelle cannot brighten up." — **Leigh Anne Tang,** *PhD student in DBMI who began as a full-time employee in the department.*

"She's what makes our department stand out. She's 'living history' in a way. And we owe a lot of our good relationships with the University to Rischelle. She's wonderful at creating and maintaining relationships that really help our program." — **Alex Becker,** *PhD student in DBMI.*

Vanderbilt Biomedical Informatics Summer Program

The Vanderbilt Biomedical Informatics Summer Program (VBISP) continued this year with a 10-week research internship program. In Spring 2024, Kim Unertl, PhD, and Brad Malin, PhD, were awarded a renewal of the National Science Foundation's Research Experiences for Undergraduates (REU) site grant for the second time. Our REU site, the Program for Access to Training in Health Informatics, attracted a record number of applicants this year, and we were able to bring in seven undergraduate students as interns through the program for summer 2024. We also sponsored one high school student thanks to funding from Daniel Fabbri, PhD, and a donation page established by VUMC Development.

Additionally, it was the second year of our summer research internship collaboration with Fisk University and Meharry Medical College, funded by a R25 grant from the National Library of Medicine: the Biomedical Informatics Ecosystem to Support Talented Diverse Students in Data Science (BEST-DS2) program. Six undergraduate students (three from Meharry and three from Fisk) joined our summer program this year. Connections across programs allowed BEST-DS2 students to attend VBISP seminars and professional development activities, and VBISP students to participate in computational skills courses.

"I have really enjoyed getting to know this incredible group of students this summer and helping them learn more about biomedical informatics and biomedical data science," said Unertl, Associate Professor of Biomedical Informatics and Director of Graduate Studies in DBMI.

The VBISP began in 2008 and has accumulated more than 150 graduates thus far—which is more than any other of our graduate programs! Many of our VBSIP have pursued degrees in informatics, as well as medicine, computer science and more. We've also had the pleasure of welcoming many of our graduates back as MS and PhD students as well as staff!

VBISP Class of 2023

In the news
Faculty highlights from 2023-2025

2025

Michael Matheny was elected to the National Academy of Medicine in October 2025. According to the Academy, Matheny has done "groundbreaking research in the use of informatics in veteran health care and automated medical product safety surveillance" by developing and adapting signal detection, machine learning and AI methods to create novel post-marketing surveillance algorithms.

Brad Malin was named a 2025 American Association for the Advancement of Science Fellow.

Peter Embí was named a recipient of the 2025 William Stead Award for Thought Leadership in Informatics.

Wei-Qi Wei and **Laura Wiley** were elected as new Fellows of the American College of Medical Informatics.

Several members of DBMI were awarded the designation of Fellow of AMIA in 2025, including **Sharon Davis, Brian Douthit, Alvin Jeffery, Siru Liu, Bryan Steitz, Lina Sulieman, Chao Yan**; secondary faculty **Barbara-Jo Achuff** and **Shelagh Mulvaney**; and alumni **Lindsey Knake** and **Peter Mack**.

DBMI secondary faculty and affiliated members **Melinda Aldrich, Carlos Grijalva, Kevin Sexton, Nicole Werner, Ivelin Georgiev, Wendy Tam**, and **Digna Velez Edwards** received Endowed Directorships.

Sharon Davis was named Associate Director of the Center for Improving the Publics' Health through Informatics (CIPHI).

DBMI awarded several of its faculty and staff for their work and efforts throughout 2025:

DBMI Admin Staff Award of Excellence – **Dylan Ford**
DBMI Research Staff Award of Excellence – **Dagmawi Negesse**
DBMI Outstanding Educator Award – **Stephany Duda**
DBMI Outstanding Researcher Award – **Wei-Qi Wei**
DBMI Technology, Organizational Development & Evaluation (TODE) Award – **Aileen Wright**
DBMI's Above-and-Beyond Award (Faculty) – **Trent Rosenbloom**
DBMI's Above-and-Beyond Award (Staff) – **Cynthia Williams**

Cathy Shyr received the 2025 ACTS Outstanding Trainee: Post-Doctoral Award from the Association for Clinical and Translational Science.

Michael Ward and team were awarded a five-year, $4.1 million grant from the NIH to assess antibiotics prescriptions and antimicrobial stewardship in unplanned care spaces across Vanderbilt Health, including emergency rooms, retail clinics and walk-in clinics.

Nicole Werner was named Director of the Center for Research and Innovation in Systems Safety.

The National Academy of Medicine empaneled groups of experts to write recommendations for the incoming Presidential administration, entitled Vital Directors for Health and Health Care: Priorities for 2025 (published in Health Affairs). **Michael Matheny** was lead author and **Peter Embí** was co-author.

Michael Matheny launched a new Health Systems Research

Center of Innovation for the Department of Veterans Affairs to expand the real-world impact of VA research.

Chao Yan and **Katie Brown** were named to JAMIA's editorial board (2025-2027).

The Dragon Ambient Experience (DAX) Copilot, ambient AI technology for clinical documentation embedded in Epic, launched at VUMC in January 2025, with **Dara Mize** at the helm of this initiative.

My Health at Vanderbilt, directed by **Trent Rosenbloom** was recognized during VUMC's Leadership Assembly. The platform has 1.2 million unique users and in 2024, patients scheduled or rescheduled over 490,000 appointments online and conducted over 226,000 telehealth visits.

Bennett Landman was named a 2025 IEEE Fellow for modeling achievements in medical image processing.

The Vanderbilt Master of Science in Applied Clinical Informatics (MS-ACI) program, directed by **Scott Nelson**, PharmD, received full accreditation by the Commission on Accreditation for Health Informatics and Information Management Education

Melinda Aldrich was elected to the Board of Directors of the American Society of Human Genetics (ASHG).

2024
DBMI awarded several of its faculty and staff for their work and efforts throughout 2024:

DBMI Admin Staff Award of Excellence – **Kelly Hammonds**
DBMI Research Staff Award of Excellence – **Eric Torstenson**
DBMI Outstanding Educator Award – **Lisa Bastarache**
DBMI Outstanding Researcher Award – **Dan Fabbri**
DBMI Technology, Organizational Development & Evaluation (TODE) Award – **Allison McCoy**
DBMI's Above-and-Beyond Award (Faculty) – **Sharon Davis**
DBMI's Above-and-Beyond Award (Staff) – **Elizabeth Brown**

Ashley Spann was named associate director of the newest Vanderbilt Center for Transplant Science.

Dan Roden was one of 10 Vanderbilt University faculty members included in the 2024 list of "highly cited researchers" around the world.

Laurie Novak was elected to the American College of Medical Informatics Class of 2024.

Peter Embí was among 100 newly elected members of the National Academy of Medicine for "his thought leadership and research led to the field of clinical research informatics, real-world evidence generation, the safe and effective use of AI in health care, and data-driven learning health systems that improve health and care."

The Department of Veterans Affairs Veterans Health Administration Office of Rural Health established an Emergency Medicine Analytics Team as part of its ongoing effort to improve health care for rural veterans, with **Michael Ward** as co-director.

Daniel Fabbri secured a two-year funding award of up to $1.9 million from the Advanced Research Projects Agency for Health (ARPA-H) to develop an innovative artificial intelligence-powered platform for extracting cancer patient data from medical records.

Ashley Spann received Research in Emerging Areas Critical to Human Health Loan Repayment (LRP) Award from the National Institute of Diabetes and Digestive and Kidney Diseases.

Cathy Ivory received the Outstanding Operational Partner Award from the VUMC Implementation team (Center for Clinical Quality & Implementation Research).

Wei-Qi Wei was elected 2024 Chancellor Fellow

DBMI faculty were elected Fellows of AMIA Class of 2024: **Yaa Kumah-Crystal, Thomas Reese, Josh Smith**, and **Zhijun Yin**.

Martin Were and team members in the Vanderbilt Institute for Global Health, in collaboration with Universidade Eduardo Mondlane located in Maputo, Mozambique, received a five-year, $1.2 million training grant by the Fogarty International Center of the National Institutes of Health to establish the Vanderbilt-Mozambique Biomedical Informatics (VM-BMI) training and research program focused on HIV.

Wei-Qi Wei received a four-year, $3.4 million research grant from the NIH to study residual risk of atherosclerotic cardiovascular disease (ASCVD) and identify any existing drugs that might help lower this risk.

Colin Walsh received Kevin B. Johnson Award

Paul Harris received ACTS Edward H. Ahrens Jr. Distinguished Investigator Award

Trent Rosenbloom was named Chair of the Scientific Review Committee at National Library of Medicine

Bennett Landman was elected to 2024 College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE)

GE HealthCare & Vanderbilt published data on AI Models predicting patient response to immunotherapy

Brad Malin was elected a Fellow of the Institute of Electrical and Electronics Engineers

Ashley Spann was named the inaugural recipient of the Harold Amos Medical Faculty Development Program Hepatology Award from the American Association for the Study of Liver Diseases (AASLD). Spann also received a Robert A. Winn Diversity in Clinical Trials Career Development Award.

2023
My Health at Vanderbilt welcomed its millionth user!

Peter Embí & team were awarded AIM-HI grant to improve use and monitoring of AI in health care

Colin Walsh was elected to the 2023 Class of International Academy of Health Science Informatics

Brad Malin received the Alexander Heard Distinguished Service Professor Award

DBMI's Impact at Vanderbilt

The Department of Biomedical Informatics at Vanderbilt houses faculty, research staff and trainees who conduct research and develop tools that directly impact patient care at the Medical Center and beyond. Within DBMI is the Vanderbilt Clinical Informatics Center, or VCLIC, which specializes in applying information technology and data analysis to improve patient care.

Vanderbilt Clinical Informatics Center

One of the clearest ways the Vanderbilt Clinical Informatics Center (VCLIC) has advanced patient care at VUMC is through the work of the Clinical Informatics Core, which supports investigators with electronic health record (EHR) data extraction, build, predictive modeling, and implementation support.

The mission of the Clinical Informatics Core is to enable VUMC researchers to design and implement electronic health record (EHR)-related tools, functionalities, and interventions with input and assistance from clinical informatics experts, as well as to gain access to and analyze EHR-based data (see chart below).

VCLIC's contributions have improved patient care across a wide range of clinical domains:

Safer Allergy Management in the ICU: Informatics-enabled protocols for de-labeling low-risk penicillin allergies enabled safe removal of allergy labels from critically ill and immunocompromised patients, reducing unnecessary use of broad-spectrum antibiotics and improving stewardship—even during the COVID-19 pandemic.

Enhanced Maternal Health Outcomes: A real-time predictive model for postpartum hemorrhage was developed, integrated into the EHR, and prospectively validated. It outperformed national tools and enabled early risk identification at the point of care.

Proactive Prevention of Pressure Injuries: A validated predictive model significantly outperformed the Braden Scale, supporting early identification and prevention of hospital-acquired pressure injuries across a large adult inpatient population.

Delirium and Deterioration Detection: We developed two complementary tools—one predicting new-onset delirium, the other forecasting imminent clinical deterioration using clinical pager messages. Both tools outperformed existing early warning systems and supported proactive care before critical events.

Expanding Diabetes Tech in Primary Care: Analysis of over 30,000 adults with type 2 diabetes revealed that continuous glucose monitor (CGM) uptake more than doubled in primary care between 2020 and 2021. These findings supported workflow improvements to expand access to diabetes technology beyond endocrinology settings.

Decision Support for Surgical Risk Conversations: Using patient-reported outcomes from over 2,000 patients with Crohn's disease, we identified actionable quality-of-life thresholds associated with the likelihood of bowel resection. These thresholds help guide preoperative conversations and support shared decision-making.

Triage Support in Rheumatology: A real-time risk model for patients with positive antinuclear antibody (ANA) tests helps identify those most likely to develop systemic autoimmune disease. It enables timely referrals for high-risk patients while reducing unnecessary consults for low-risk individuals.

Addressing Model Implementation Challenges: We developed a novel sub-model approximation approach that enables real-time execution of prediction models even when key variables are missing. This supports broader and more feasible integration of models into EHR workflows.

The **Evaluation & Dissemination (E&D) program** ensures that innovative HealthIT initiatives at VUMC are rigorously assessed and their impact widely shared. By pairing VCLIC informaticians with HealthIT staff, the program has helped improve tools, reduce burden, and spread successful practices across the institution.
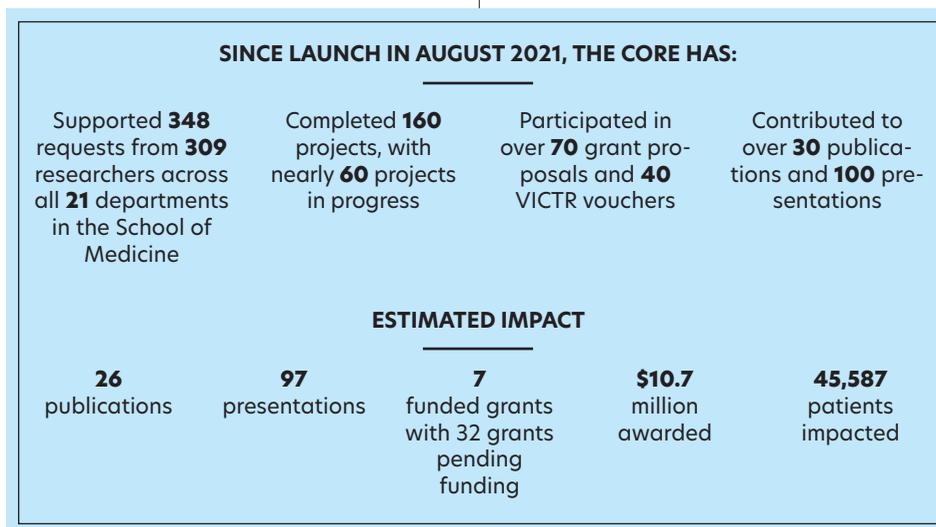
Since the launch in 2019, the E & D team has contributed to:
• 19 completed projects, with 25 more in progress
• Numerous peer-reviewed publications and national presentations
• Evaluations spanning inpatient, outpatient, and digital health initiatives across VUMC

Examples of evaluated projects and their impact include:

EHR Burden Reduction: Redesign of the "Current Visit" tab led to a 13% reduction in clicks, 30% less time in activities, and savings of up to 10 minutes per user per day in walk-in clinics. This change has since been incorporated into Epic's foundation system.

Opioid Safety Alert: A CDS alert targeting patients at risk of opioid overdose in-

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SINCE LAUNCH IN AUGUST 2021, THE CORE HAS:

Supported **348** requests from **309** researchers across all **21** departments in the School of Medicine

Completed **160** projects, with nearly **60** projects in progress

Participated in over **70** grant proposals and **40** VICTR vouchers

Contributed to over **30** publications and **100** presentations

ESTIMATED IMPACT

| **26** publications | **97** presentations | **7** funded grants with 32 grants pending funding | **$10.7** million awarded | **45,587** patients impacted |

creased naloxone prescribing more than 16-fold, improving safety for a high-risk population.

Telehealth Equity: Evaluation of 45,000+ telehealth visits revealed disparities by age, insurance, and race. A structured pre-visit phone call intervention significantly improved video visit completion among vulnerable groups.

Nursing Task Completion: A revised intake checklist doubled task completion rates (from 23% to 50%) without increasing time spent by nurses.

Patient Engagement via Messaging: Secure messages were sent to over 10,000 patients not previously active in MyChart, leading to 31% portal activation, improving access to care and test results.

Asynchronous Visit Follow-Up: Analysis of post-eVisit utilization and messaging patterns is informing how virtual visits impact downstream care coordination.

Clinical Decision Support (CDS) Evaluation: As part of VUMC's CDS team, E&D supports the review, revision, and retirement of decision support tools. In recent months, this collaboration has contributed to over 20 CDS interventions implemented or revised, 6 retired, and more than 500 alerts updated to include success criteria—reflecting a growing emphasis on measurable outcomes. Ongoing evaluations continue to assess effectiveness and relevance for both main campus and Community Connect sites.

Evaluation & dissemination results:

• **19 projects completed, 25 in progress**

• **Current visit tab:** Resulted in 13% fewer clicks per user, 30% fewer minutes in activities, and up to 22 clicks and 10 minutes saved per user per day in walk-in clinics.

• **Nursing intake checklist:** Doubled completion of necessary tasks, from 23% to 50%, without increasing time spent by nurses in the patient room.

• **Messaging for all:** Enabled over 10,270 messages to be sent to patients who were not active on MyChart (My Health At Vanderbilt), with 31% of these patients subsequently activating their MyChart accounts.

Another key VCLIC initiative is the eStar Physician Builder Program, led by Jonathan Wanderer, MD, MPhil. More than 100 physician-builders now complete over 600 EHR improvement projects annually, adapting Epic to Vanderbilt's unique workflows and embedding local best practices directly into clinical tools. This distributed approach ensures that those closest to patient care actively shape the technology they use daily, preserving the participatory design culture that defined Vanderbilt's early WizOrder era.

Equally impactful has been VCLIC's Clickbusters program, a systematic campaign against alert fatigue led by Adam Wright, PhD; Neal Patel, MD; and Allison McCoy, PhD that exemplifies Vanderbilt's commitment to evidence-based informatics. Clinical teams methodically reviewed every decision support alert in Epic, evaluating each for clinical relevance, evidence base, and user impact. Outdated or redundant alerts were eliminated, while others were refined to trigger only when most clinically meaningful. Across multiple "seasons," Clickbusters improved or retired hundreds of alerts, reducing overall alert volume by 15% while restoring clinician confidence in decision support systems. The program quickly gained national recognition as a model for continuous EHR optimization.

Driving Better Care through Clinical Informatics at VUMC

Highlights from the Clinical Informatics Core and Evaluation & Dissemination Program

Clinical Informatics Core

- 348 requests
- 309 researchers across 21 departments
- 160 projects completed, 50+ in progress
- 70+ grant proposals, 40 VICTR vouchers
- 30+ publications, 100+ presentations

Evaluation & Dissemination Program

- 19 completed projects
- 25 in progress
- Cross-cutting evaluations across inpatient, outpatient, digital health

VCLIC
VANDERBILT CLINICAL INFORMATICS CENTER

Connecting data, people, and technology to make better care possible–today and for the future.

Real-World Impact:

Allergy Management
Delabeled penicillin allergies → safer antibiotic use

Maternal Health
PPH model improved early risk detection

Delirium, Deterioration, and Pressure Inuries
AI tools enabled early interventions

Diabetes Tech Access
CGM uptake doubled in primary care

Surgical Risk Conversations
PROM thresholds guided Crohn's disease care

Rheumatology Triage
ANA risk model improved referrals

EHR Usability
"Current Visit" tab redesign → 13% fewer clicks, 30% less time

Opioid Safety
CDS alert → 16x increase in naloxone prescribing

Nursing Workflow
Intake checklist → 2x task completion

Patient Engagement
Messages to non-MyChart users → 31% activated accounts

eVisit Follow-Up
Informed care coordination post-asynchronous visits

CDS Evaluation
500+ alerts reviewed with success criteria added

DBMI Admin News

DBMI Welcomes Lynda Christel as CBO

Lynda Christel joined the Department of Biomedical Informatics at Vanderbilt University Medical Center as our newest Chief Business Officer, effective January 13, 2025.

Previously, Lynda worked as an Operations Administrator within the Departments of Neurosurgery and Neurology and was an Assistant Professor in Healthcare Administration at Mayo Clinic in Jacksonville, Florida. As a healthcare executive, Lynda enhanced revenue through practice optimization, operationalized innovative ideas and service efficiency, led teams of physicians and executive leaders, and developed staff. She is a member of the Board of Directors of the American College of Healthcare Executive (ACHE).

Upon joining DBMI, Lynda took on a number of responsibilities and initiatives, including initial tasks helping to advance DBMI's strategic plan and financial initiatives, driving culture and enhancing team-building strategies. Welcome, Lynda!

Many Thanks to the DBMI Admin Staff for their hard work this year!

Back Row: Cynthia Williams, Claudia McCarn, Lynda Christel, Barbara Payne, Rischelle Jenkins, Joyce Green

Front Row: Emma DaSilva, Dylan Ford, Wil Comstock, Doug McCoy

59	**70**	**25**	**66**
Primary Faculty	Secondary Faculty	Adjunct/Adjoint Faculty	Staff

DBMI's national footprint continues to expand, with a workforce represented in **more than 15 locations nationwide**, including—though not limited to—Ohio, Wisconsin, South Carolina, Minnesota, North Carolina, Georgia, Illinois, Kentucky, Arizona, Maryland, Washington, Maine, Massachusetts, and Louisiana.

Elizabeth Brown, CBO of DBMI, Retires

On January 1, 2025, our amazing Chief Business Officer, Elizabeth Brown, departed the Department of Biomedical Informatics at VUMC to spend more time with family.

Elizabeth served DBMI in exemplary fashion for nearly two decades, managing everything from administrative and financial tasks to overseeing multi-million-dollar budgets. During her tenure, the department grew to being the largest and most successful informatics department in the country, and she played a major role in our many achievements.

She had long been the backbone of this department and a critical source of leadership throughout the years, including through many changes such as Chair transitions from Dan Masys to Kevin Johnson to Peter Embí.

"I felt fortunate to have been a part of Biomedical Informatics for the past 18+ years and appreciate the invaluable experience that the opportunity has provided me. I care deeply for the institution, its mission and people," Elizabeth shared prior to her departure.

"Since being employed at VUMC, I have felt much pride in being associated with the Medical Center. I have sincerely cared for my colleagues, and it has been a joy to serve them. The fact that I could support others, who were involved in what I consider one of the most noble professions (health care), has brought great purpose and meaning to my career.

"I hope that my administrative contributions have impacted the department in a positive way. I wish the department the very best moving forward and I will enjoy keeping up with the wonderful progress that I am sure will be made in the years to come."

In Memoriam

Vanderbilt mourns loss of pediatric informatician Stuart Weinberg

Stuart T. Weinberg, MD, an innovator and advocate in the field of pediatric informatics with expertise in clinical reminders, web services, personal health records, immunization registries and clinical decision support at the provider, institutional and national levels, died on July 18, 2023, in Franklin, Tennessee. He was 63.

Dr. Weinberg was passionate about finding and implementing solutions to barriers to the delivery of health care to children. As one of the preeminent pediatric informaticists in the nation, he led work on immunization tracking and registries. At the time of his retirement in January 2022, Dr. Weinberg was actively applying these efforts at Vanderbilt, across the state of Tennessee, and through a national organization seeking to improve the quality of immunization databases. One notable result of these efforts was the successful identification and resubmission of more than 8,000 vaccines from Vanderbilt, including hundreds of COVID-19 vaccine doses, which had been previously rejected due to various errors.

"Dr. Weinberg was an accomplished informatician, a trusted colleague, and a wonderful person," said Randy Miller, MD, emeritus professor of Biomedical Informatics at VUMC. "Some of the best contributors to our field are clinician-informaticians with a decade or more of direct patient care experience who also possess considerable skill in inventing algorithms and writing code. They develop systems intended to help other clinicians and their patients. They repeatedly check the 'patient' (clinical installation site) to make sure the system has the intended effects and minimal side effects. They make timely adjustments as needed. A dedication to improving patients' health over time transfers favorably to clinical informatics — and Stuart provided one of the best examples of this at Vanderbilt."

"We will miss his enthusiasm and dedication to doing things the right way. Our heartfelt condolences go out to his wife, Anne, and his family," Miller said.

Vanderbilt mourns loss of informatics and HealthIT leader Edward Shultz

Edward Shultz, MD, MS, a pioneer in biomedical informatics, data science and IT architecture, died Nov. 30, 2024. He was 76.

"Ed Shultz's visionary leadership in the Informatics Center was instrumental in pioneering the development of innovative clinical applications and robust core infrastructure," said Neal Patel, MD, MPH, chief information officer for HealthIT at VUMC. "His dedication and expertise not only advanced the field of biomedical informatics but also significantly enhanced the quality of patient care and operational efficiency at VUMC."

Dr. Shultz came to Vanderbilt in 1997, where he served as director of technology integration and later as chief technology officer of the Informatics Center. In the Informatics Center, he led the teams of software developers, integration specialists and information architects who helped create tools and capabilities that were key advancements for the clinical information systems developed at VUMC. He gained national recognition for his research, teaching and service as associate professor of Biomedical Informatics until his retirement in 2016.

Staff Spotlight

Mia Garchitorena-Scancarelli, MA, Senior Communications Specialist Brings Innovation and Impact to Department and Entire Institution

When Mia Garchitorena-Scancarelli, MA, first left St. Louis for New York City in 2014, it was a bold step. She left everything she knew behind in Missouri to take a chance on graduate school. Luckily for DBMI, her hard work paid off.

Now well-known as our department's Senior Communications Specialist, Mia joined DBMI in 2020. At the time, she was fresh off a senior communications role at Memorial Sloan Kettering Cancer Center in New York, where her primary focus at MSK was functioning as a behind-the-scenes reporter. She later spearheaded company-wide emergency communications during the early stages of the COVID-19 pandemic. When Mia joined DBMI as the department's first full-time communications specialist, she was thrilled to work under the leadership of Dr. Kevin Johnson.

Together, the two worked closely to establish a blueprint for departmental communications practices. Over the last five years, Mia has led strategic initiatives with both Dr. Johnson and his successor as Chair, Dr. Peter Embi. Today, she is happy to collaborate with our Interim Chair, Dr. Josh Peterson.

A daughter to two emergency medicine physicians, Mia spent a lot of her childhood in hospitals—often in the emergency department on-call lounge—while her parents cared for patients. As an adult, Mia didn't necessarily want to be a doctor, but saw herself working in the world of medicine and health sciences.

Mia pictured at the ADVANCE Symposium with administrative colleagues Jennifer Martellotti, Kelly Hammonds, and Julia Groh.

After receiving her bachelors' degree from St. Louis University, Mia emerged as a talented writer and storyteller. For her next step, she naturally leapt at the opportunity to enroll in the CUNY Graduate School of Journalism in Manhattan.

The program, located next door to The New York Times offices, offered a tailored education with a multi-disciplinary focus in Health and Science Reporting. It's there where Mia flourished and pursued investigative health stories, cross-collaborated between hospital systems and medical publications, and published a widely respected capstone project. It's where she met her now husband, Derek Scancarelli, MA, who also works in communications for VUMC. The two welcomed a daughter, Pearl Eloise, in December 2025.

After CUNY, Mia worked as an editor at various medical publications before pivoting into hospital communications. It was her work collaborating with institutions like Weill-Cornell Medicine that inspired her to chase a role at MSK. When it was time for a change, Mia knew what was next: move to Nashville and work at the world-renowned Vanderbilt University Medical Center.

Since joining DBMI, Mia has been instrumental. She routinely collaborates with leadership, Vice Chairs, Center Directors, and our staff. Since 2024, Mia has worked tirelessly to contribute to the successful launch and continued growth of the department's artificial intelligence ADVANCE Center. She has implemented strategy for our Grand Rounds, created and manages our newsletter, the DBMI Digest, and launched the DBMI Faculty Flight Tracker to automatically feed faculty publications to our web presence.

Mia is also responsible for production of our Town Halls, annual retreats, and large symposiums, which often require a complex web of communications, technical AV requirements, and a large digital footprint.

Mia's contributions have reached beyond our department. She has reinvented the way communications operate at VUMC with her co-creation of an interdepartmental communications network. The group now functions as the official channel for collaboration and consistency across the entire institution. Mia has also partnered with leadership in the office of Marketing and Engagement to help launch the hospital's first-ever internal intranet. Because of her proactive work, DBMI was featured in the project's "Phase 0" launch in 2024.

It is clear why Mia was the recipient of the DBMI Above and Beyond Award for Outstanding Service in 2022. In addition to high quality of work, Mia is regarded as a colleague who is kind, compassionate, and intelligent. We look forward to her continued professional growth in DBMI.

"Together, we build connections that shape the future of health. Through collaboration and innovation, we transform practice, influence policy, and accelerate discoveries — creating a future where informatics fuels discovery and elevates health outcomes for all populations."

VANDERBILT V HEALTH