VCLIC

VANDERBILT CLINICAL INFORMATICS CENTER

VCLIC ANNUAL REPORT

2024-2025

DIRECTOR'S WELCOME

Adam Wright, PhD
Director, VCLIC
Professor of
Biomedical Informatics
and Medicine

Welcome to VCLIC's fifth annual report. VCLIC continues to be a thriving community at the intersection of patient care and clinical informatics. This year, we expanded the reach and effectiveness of VCLIC's physician builder program, VDAWGs data access program, clinical informatics core and evaluation and dissemination program. These efforts are not just academic – they are transforming the way we deliver care.

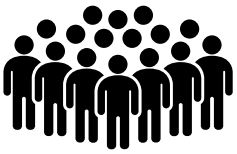
As highlighted in this report's impact section, our members' work has led to meaningful improvements in patient safety, quality, workflow, and cost-effectiveness. Across VUMC, informatics is deeply embedded in frontline care, helping clinicians make better decisions, reducing documentation burden, and improving patient outcomes.

Yet we do not operate in isolation. This year has brought challenges, including financial pressures and an uncertain research environment that impact both VUMC and VCLIC. But VCLIC's defining strengths remain unchanged:

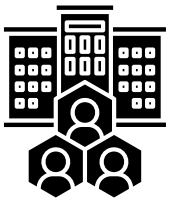
1. Our extraordinary, creative, innovative and committed members,
2. Our deep, productive partnership with HealthIT,
3. Our close integration with clinical departments and care delivery,
4. Our unparalleled access to data and our ability to build, deploy and evaluate innovative solutions
5. Vanderbilt's culture of collaboration, curiosity, and continuous improvement.

Thank you for being part of VCLIC. I hope this report gives you a sense of the energy, creativity, and purpose that define our work. We look forward to building on this momentum in the year ahead.

VCLIC BY THE NUMBERS

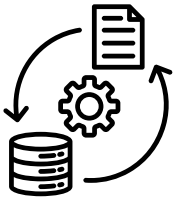


88 CENTER MEMBERS



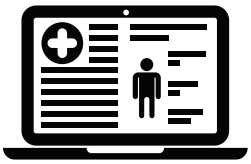
25 DEPARTMENTS REPRESENTED

397 MEMBER PUBLICATIONS



32 VDAWGS DATA USERS

97 PHYSICIAN BUILDERS



114 CORE PROJECTS

VCLIC PROGRAMS

Clinical Informatics Core

The VCLIC Clinical Informatics core provides services to VUMC investigators, including EHR data extraction, building interventions in the EHR, predictive modeling, and consultation.

Since launch, the Core has:

- Supported **348 requests** from **309 researchers** across all **21 departments**
- Completed **160 projects**, with **50 more in progress**
- Participated in over **70 grant proposals** and **40 VICTR vouchers**
- Contributed to over **30 publications** and **100 presentations**

VCLIC + HealthIT Evaluation and Dissemination

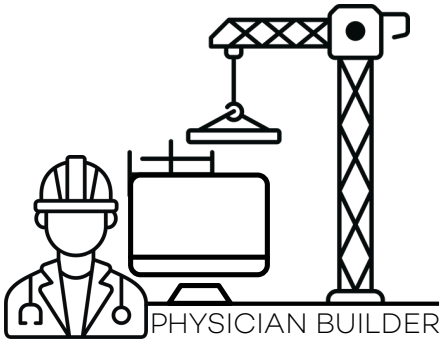
The Evaluation & Dissemination (E&D) program is a key partnership between VCLIC and HealthIT. The E&D program, rigorously assesses the impact of tools implemented by HealthIT and disseminates the results both internally and externally. By pairing VCLIC informaticians with HealthIT staff, the program has helped improve tools, reduce burden, and spread successful practices across the institution and field.

To date, the 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

VDAWGs

The Vanderbilt Data Access Working Group (VDAWGs) allows VUMC faculty and sponsored staff to access VUMC's clinical databases including Clarity and Caboodle directly and through VUMC's Databricks platform. This year, we added additional data sources, including physiologic monitor and endoscopy data to the program. VCLIC supports knowledge sharing and audits use. VDAWGs grew to **32 members** and our members ran **86,982 queries** in the last year.



Physician Builder Program

Physician Builders at VUMC are trained to build new content in Epic, such as order sets, documentation templates and alerts. Physician builders work from their home clinical department to improve the EHR for their colleagues, working closely with HealthIT analysts. VUMC has the largest builder program in the country, and we added 16 new builders this year, growing our program to **97 builders**. These **builders completed 455 projects** this year.

COMMUNITY

VCLIC is a vibrant community of faculty, staff, and students from across VUMC and Vanderbilt University. We gather regularly to support collaboration, learning, and clinical informatics innovation at VUMC. We do this through monthly newsletters, our website and Confluence knowledgebase, and informal gatherings and celebrations, as well as InformaticCon.

This year's Lightning Talks included:

- "Using Visual Analytics Decision Support to Optimize Quality Sedation Practice in the Cardiac Intensive Care Unit" **Barbaro-Jo Achuff, MD**
- "Using Large Language Models to Guide Patients to Create Efficient and Comprehensive Clinical Care Messages" **Siru Liu, PhD**
- "Game on: ChatGPT vs. Residents and Faculty in a Diagnostic Duel" **Liam Schnelle** and **Yaa Kumah-Crystal, MD, MS**
- "Quantifying Immediately Released Test Results that Contribute the Highest Volume of Patient Messages" **Alex Becker, MS**
- "Intelligent Scheduling Flows: From Requirements to Implementation Using Graph Models and AI" **Janos Mathe, PhD**
- "EHR Embedded Clinical Trials" **Eddie Qian, MD, MS**
- "A Vision for Standardizing Sight" **Eric Brown, MD, PhD**

InformaticCon

We held our third annual InformaticCon last August. This year's event featured a panel discussion on VUMC's nationally-recognized Physician Builder program, eight Lightning Talks on clinical informatics-focused projects, and a poster session featuring nearly 30 posters highlighting clinical informatics innovations.

Six posters were selected as "best posters" at this year's InformaticCon:

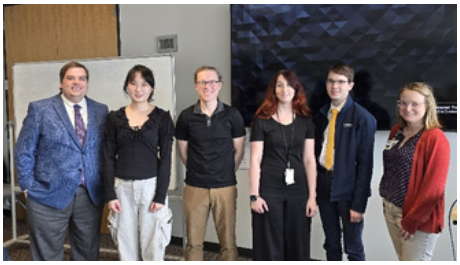
- "Implementation of a flowsheet to track patients with inflammatory bowel disease initiating a biologic with complex dosing regimens" **Kristen Whelchel, PharmD**
- "Evaluating the Antibiotic Spectrum Index as an Outcome in the Context of a Randomized Clinical Trial" **Sabrina Carro, MD**
- "The Integration of a Neonatal Multiuse Clinical Database Within the Electronic Health Records" **Eva Dye, DNP, APRN**
- **"Assessing the need for a clinical** decision support tool to improve random urine drug screening for patients on chronic opioid therapy" **Hyunjoon Lee, MS**
- "eVisit then what? A Patient-level Analysis of Care Utilization and Messages" **Jacob Franklin, MD** and **Thomas Ueland**
- "Delinking Cephalosporin Cross Sensitivity Alerts in Patients with PAL"- **Megan Wang**

EDUCATION

Clinical Informatics Course

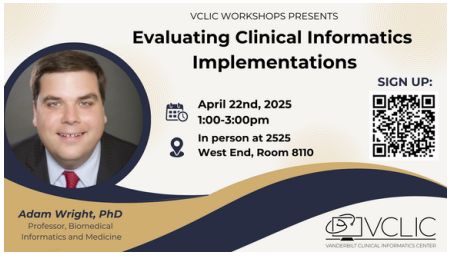
This spring, **Adam Wright, PhD** and **Allison McCoy, PhD** taught BMIF 7340: Clinical Informatics for the fourth time. This year's student projects included:

- Automating Medication Review with RAG (**Azure Xia**, **Matt**
- **Murrow**, Mentor: **Jon Wanderer, MD, MPhil**)
- Moving From Obsolete Bone Atlas to Flowsheet Calculations in Epic (**Brandon Buxton**, **Rachael Miller**, Mentor: **Yaa Kumah-Crystal, MD,** MPH, MS)



Workshops

For academic year 2024-2025, VCLIC offered several in-person workshops aimed at increasing our community's knowledge of Epic, the data it contains, how to build interventions into our EHR, and how to evaluate the interventions implemented into the EHR. We also offered a special FHIR workshop led by **Russ Leftwich, MD**.



VCLIPS

VCLIPS are actionable videos about key clinical informatics topics. This year, we added:

Using Nebula for Predictive Model Implementation (Adam Wright, PhD)
Learn about Cognitive Computing with Nebula, how to train and validate a predictive model in Databricks, and workflow options for implementing predictive models into Epic

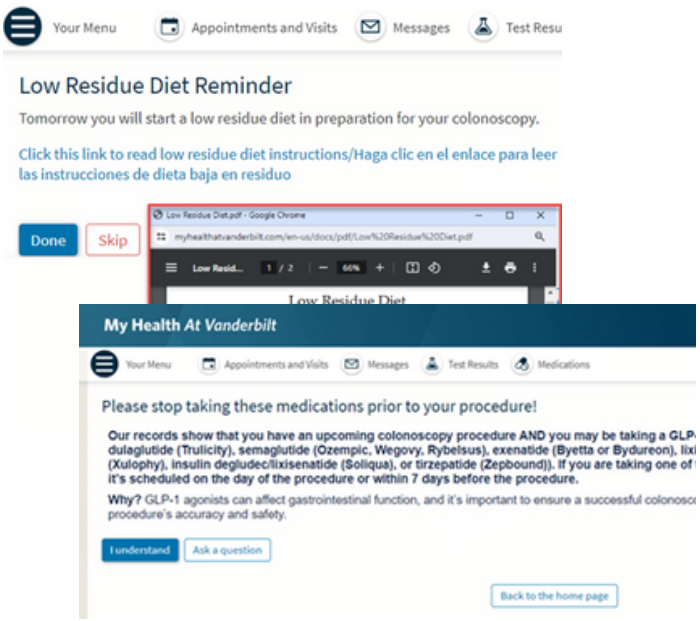
Value Sets (Scott Nelson, PharmD, MS)
Learn what value sets are, how to visualize and understand ontologies and hierarchies using RxNorm and SNOMED CT, and how to use them to create your own Epic groupers

Creating Test Patients in Epic (Allison McCoy, PhD)
Learn how to create a test patient in Hyperspace as well as how to create inpatient and outpatient encounters, input patient data, and create MyChart accounts

IMPACT

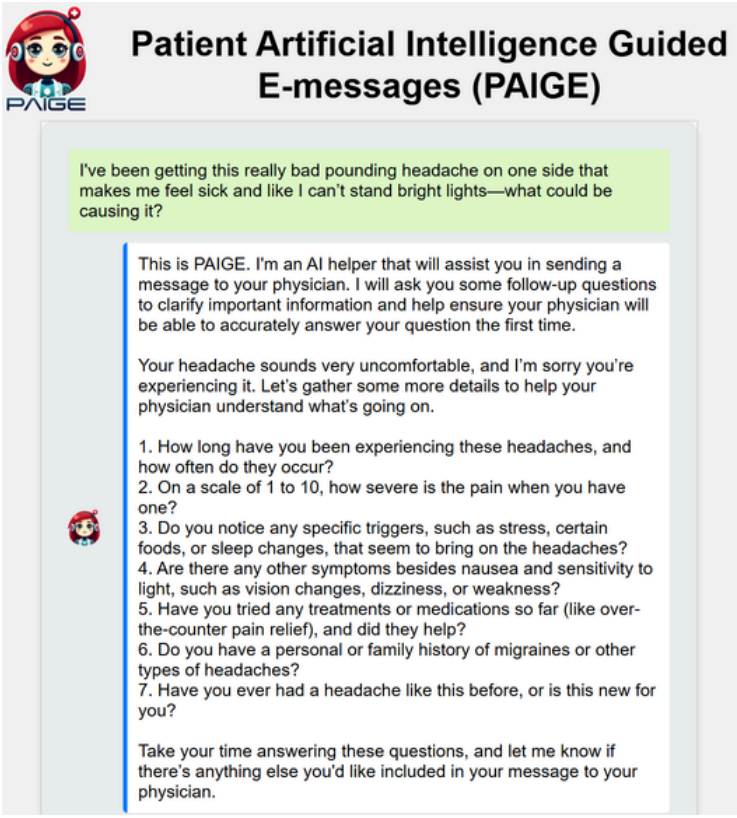
Colonoscopy Care Companion

Vanderbilt completes over 15,000 lower GI endoscopies. Patient need to complete a bowel prep regimen before their endoscopy, and poor prep can lead to poor study quality. **Sara Horst, MD, MPH** led a project to implement a new Care Companion within MyHealth at Vanderbilt. The Companion walks patients through their bowel prep and other important pre-procedure steps, such as holding GLP-1 inhibitors. The user-friendly tool can send reminders, answer questions and allow patients to connect with their care team. After the tool went live, 6.1% of patients who were assigned to Care Companion had incomplete bowel prep, compared to 9.3% of patients who were not assigned the tool.



AI-Guided Patient Messaging

Vanderbilt patients send 2.9 million messages to their healthcare providers through MHAV every year, and consistently express appreciation for the option to message with their care team. However, in many cases, a patient may not provide enough information in their first message to resolve their issue. **Siru Liu, PhD** and **Adam Wright, PhD** have developed a new tool, Patient Artificial Intelligence Guided E-messages (PAIGE) that asks followup questions to patients and helps them make their message more complete. The tool uses the latest AI methods, including large language models (LLMs) and retrieval-augmented generation (RAG) to ensure the questions are appropriate and grounded in VUMC's existing clinical protocols.

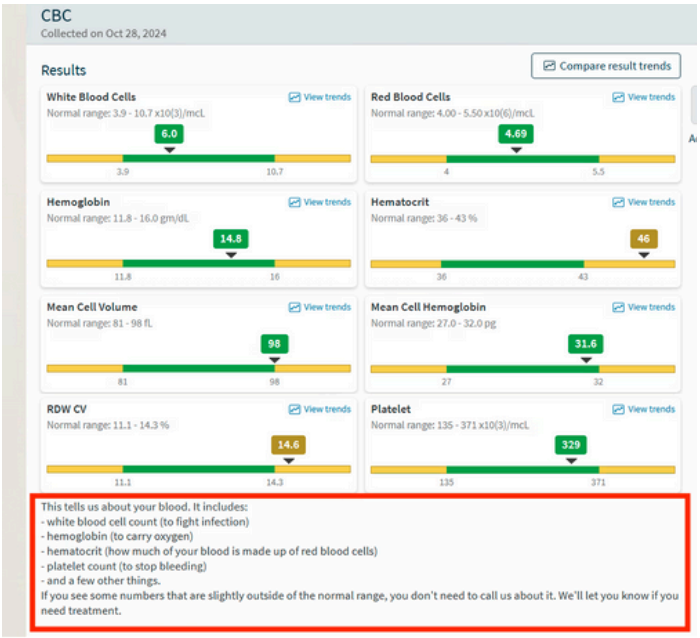


After developing and validating it as a research tool, the team worked with HealthIT's System Intelligence Platform and MyChart teams to integrate it with MHAV and is working on a pilot with primary care patients and VUMC access center staff. The goal is to reduce back-and-forth messaging, decrease provider workload and improve the patient experience.

IMPACT

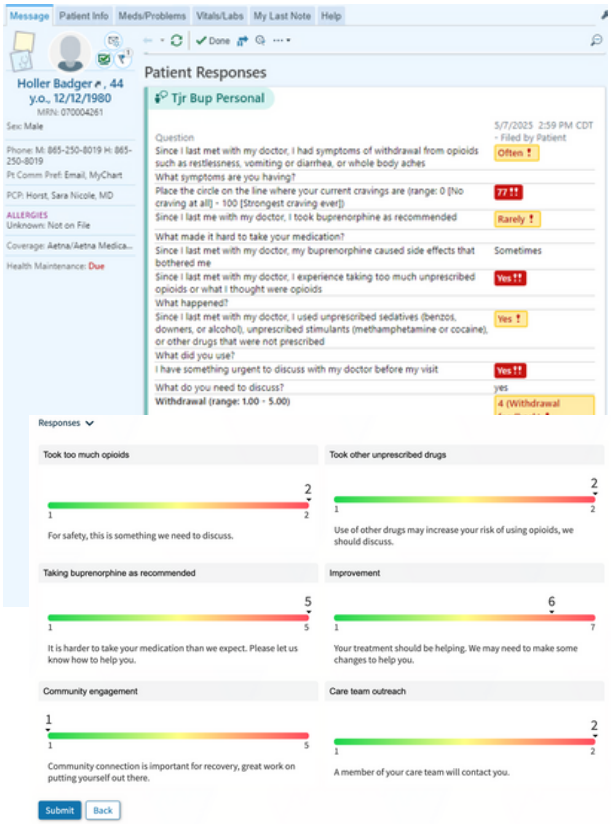
Patient Education on Test Results

Vanderbilt patients now see their test results in MyHealth at Vanderbilt at the same time as their care team. This empowers patients, but the information can sometimes be confusing. Collaborating with the Rapid-LHS program, **Bryan Steitz, PhD** led work to understand patient's preferences for receiving test results and improve how they access and interpret their results. These initiatives include changes to default notification settings that allow patients to better reflect their preferences for result release and educational details provided alongside test results. These efforts have impacted how over 90% of MyHealth users engage directly with their health information in real time and help them understand it more clearly. Dr. Steitz continues to lead initiatives aimed at personalizing the experience of awaiting, receiving, and acting on electronic health information delivered through the portal.



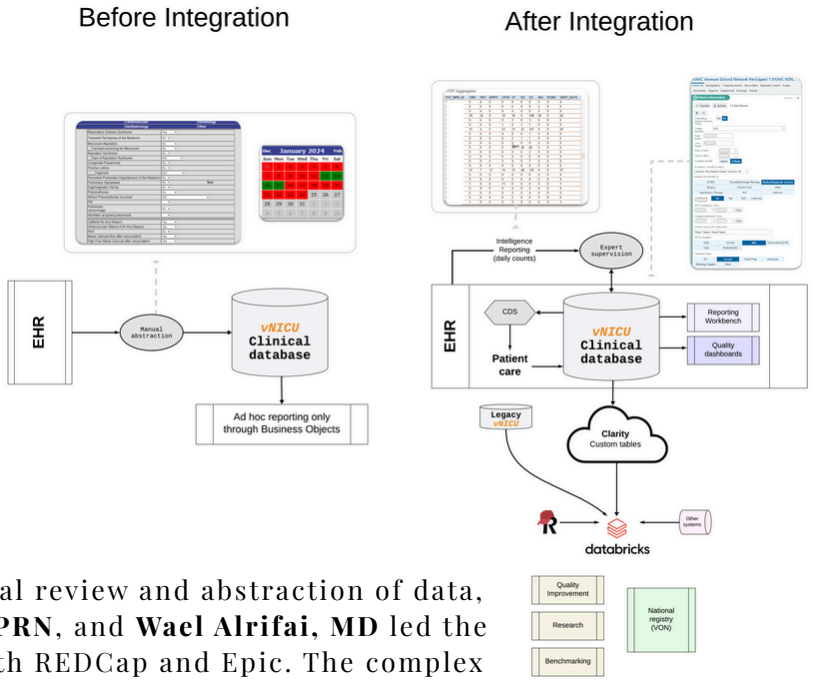
Measurement-Based Care for Opioid Use Disorder

Opioid Use Disorder (OUD) is a common, treatable illness, but patients with OUD are not always properly identified and treated. Treating OUD effectively requires a proactive approach, as patient symptoms and risks can fluctuate significantly between appointments. **Thomas Reese, PharmD, PhD**, developed a novel tool to apply the principles of measurement-based care (MBC) to OUD. MBC refers to the systematic use of patient-reported outcome measures (PROMs) and other clinical measures (e.g., urine drug testing, medication adherence) to inform clinical decisions, improve patient-provider communication, and enhance treatment outcomes. The tool captures relevant data and calculates risk scores, identifies care gaps, and suggests potentially appropriate treatment strategies. It integrates seamlessly into clinical workflows, supporting personalized and proactive care. Based on its success at Vanderbilt, Dr. Reese plans to scale this work in a multisite trial to evaluate its broader impact and clinical effectiveness.



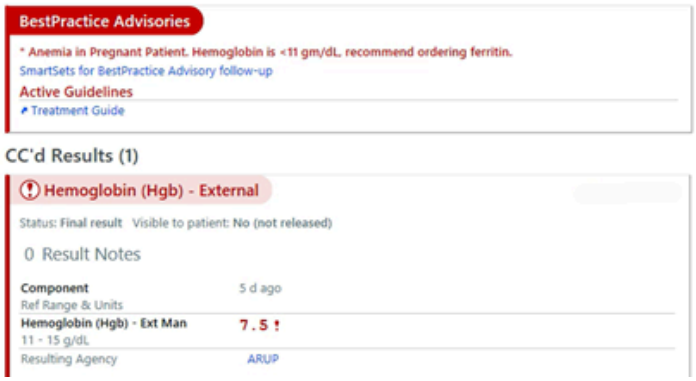
IMPACT

NICU Clinical Database Integration



The neonatal intensive care unit at Monroe Carell Jr. Children's Hospital at Vanderbilt is the largest NICU in Tennessee, and takes care of over 1,600 infants each year. The NICU conducts a range of research and quality improvement activities, and participates in the international Vermont Oxford Network, a network of more than 1,400 hospitals that share data to improve the quality of neonatal care worldwide. These efforts are data intensive, and VUMC staff have manually maintained clinical datasets in a locally-developed vNICU tool. This work has typically involved manual review and abstraction of data, which is time-consuming. **Eva Dye, DNP, APRN**, and **Wael Alrifai, MD** led the successful integration of the vNICU tool with REDCap and Epic. The complex project included design of new data collection tools in Epic, as well as backend work which took advantage of VUMC's Databricks platform. The effort resulted in significantly improved data accuracy, substantial efficiency gains, equivalent to one RN FTE annually, and a reproducible framework now being scaled to support data operations for the Pediatric Heart Institute.

Managing Anemia During Pregnancy



Anemia is a common complication in pregnancy and is associated with a range of adverse maternal and fetal outcomes, including fatigue, preterm birth, and low birth weight. Prompt diagnosis and appropriate treatment with iron supplementation can restore normal hemoglobin levels before delivery. However, many pregnant patients are not identified or treated in time. To address this gap, **Colleen Morton, MBBCh, MS**, spearheaded a clinical decision support (CDS) initiative at Vanderbilt aimed at optimizing the identification and treatment of anemia during pregnancy. The project was supported by **Kelly Brown** and **Daniel Hausrath, MD**, along with the VCLIC-HealthIT Evaluation and Dissemination Program. In Phase 1, the team deployed a non-interruptive OurPractice Advisory (OPA) within Epic, which recommended iron therapy for pregnant patients with anemia. This initial intervention led to an 18% increase in iron prescribing rates. Building on these results, Phase 2 introduced a more strategically timed version of the OPA, appearing during Inbasket Results Review when providers are more likely to act. a moment better aligned with typical provider workflows. This enhancement led to a 32% increase in iron prescribing.

HEALTHIT HEADLINES

Dara Mize, MD, MS, Chief Medical Information Officer
Serving as CMIO at an academic medical center is rewarding because it lets me bridge academic and operational clinical informatics, ensuring we deliver on important organizational initiatives and also innovate to improve care at VUMC.

In HealthIT, we're proud of our progress in FY25, including:

DAX Copilot: VUMC providers now have access to DAX Copilot, an AI-powered ambient scribe. DAX listens to provider-patient conversations during office visits and drafts clinical notes for provider review. Because notes are drafted automatically, providers can pay better attention to their patient and complete documentation more quickly. VUMC's early adopters reported 25% less time spent writing notes and a 50% drop in evening EHR use ("pajama time"). HealthIT implemented DAX across all outpatient clinics and emergency departments.

Aidoc: Each year, VUMC radiologists interpret hundreds of thousands of imaging studies. The vast majority are routine, but some reveal urgent findings such as intracranial hemorrhage or pulmonary embolism. HealthIT implemented Aidoc, an AI tool that analyzes studies and flags those with suspected critical findings in the radiology worklist. Every examination is still reviewed by VUMC radiologists, but Aidoc ensures that potentially life-threatening cases are prioritized and addressed without delay.

Community Connect: As an Epic-certified partner, VUMC now hosts Epic for other regional providers. Our first site, Heritage Medical Associates, will go live on an Epic instance managed by VUMC, backed by new technical, clinical, and support infrastructure. Community Connect improves care in the region by fostering better coordination through integrated EHR systems.

HealthIT also continued to play a key role in clinical informatics education. Thirteen Vanderbilt medical students participated in the Clinical Informatics Integrated Science Course, which I direct with Travis Osterman. Our fellowship program recently celebrated Jake Franklin's graduation, promoted Sarah Stern, and welcomed Peter Samuel as our new fellow. Each year, these trainees contribute meaningfully to work in HealthIT and across VUMC, and provide another key bridge between HealthIT, DBMI and VCLIC.

Looking ahead to FY26, we'll focus on increasing efficiency, automating routine tasks, and building intuitive self-service tools for patients. We're exploring AI throughout the care journey to improve patient experience and care quality while reducing costs. I'm excited to deepen our collaboration with VCLIC as we tackle these goals together.

HealthIT

Accountability | Transparency | Execution

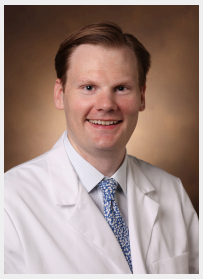
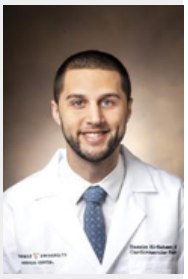
AWARDS

Physician Builder Award


Jacob Franco, MD is a builder in hospital medicine. He created a hospital medicine scorecard to track key metrics like medicine boarders, paging volume, admission quality, timely discharges and readmission rates. **Daniel Barrett, APRN, MSN** focuses on pediatric critical care and has improved tools for clinical documentation, data review, wound care and billing. He has presented his work at Epic's XGM conference, and it has been adopted at other hospitals.

Clinical Informatics Core Outstanding Data Project

The Clinical Informatics Core recognizes **Justin Bachmann, MD, MPH** and **Bassim El-Sabawi, MD** for their project, "Using patient-reported outcome data to predict hospitalizations in heart failure patients." Published in the Journal of the American College of Cardiology, the study found that lower KCCQ-12 scores and noncompletion were strongly associated with higher hospitalization and mortality risk, supporting its use as a prognostic tool in outpatient care.

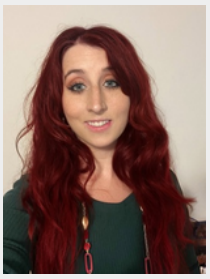



Clinical Informatics Core Outstanding Build Project


The Clinical Informatics Core recognizes **Cosby Stone, MD, MPH**, and **Milner Staub MD, MPH** for their project "Implementing Penicillin Allergy Risk Stratification to Increase Use of Perioperative Cefazolin." This project focused on adapting and implementing a validated penicillin allergy questionnaire in the perioperative setting to identify low-risk patients, improve first-line antibiotic use, and enhance surgical outcomes.

Outstanding Clinical Informatics Course Student Project

This semester, **Brandon Buxton, MS**, and **Rachael Miller, PharmD**, mentored by **Yaa Kumah-Crystal, MD, MPH, MA** completed the outstanding project in BMIF 7340 by building Epic functionality to replace outdated paper-based bone age charts used in pediatric endocrinology, to streamline clinical workflows, reduce cognitive burden, and improve accuracy in skeletal maturation assessments.


Outstanding Evaluation and Dissemination Project


This year's Evaluation and Dissemination award goes to **Ashley Spann, MD, MSACI** and **Sara Horst, MD, MPH** who implemented an automated tool and templated polyp notification letter following colonoscopy to help change the health maintenance recommendations for patients who needed shorter interval follow up tests. The intervention significantly increased the reliability of post-adenoma surveillance documentation in the EHR, from 83% to 94%, and the authors will be presenting results at ACG.

CENTER MEMBERS


VCLIC