Vanderbilt University Medical Center
Strategy Framework 2013
Vanderbilt University Medical Center

Vanderbilt University Medical Center (VUMC) is a comprehensive academic medical center dedicated to patient care, research, and the education of health care professionals. VUMC is part of Vanderbilt University with a common Board of Trust and one financial bottom line.

VUMC health system facilities include four hospitals on the University’s campus with more than 50,000 discharges and 1.7 million outpatient visits per year. Centers of excellence include cancer, cardiovascular disease, children’s services, diabetes, transplantation, and the region’s only level-1 trauma center. VUMC is recognized nationally for clinical and management excellence in listings such as the U.S. News and World Report, Leapfrog, and Thomson Reuters Truven Top 100 hospitals. VUMC delivers $400 million in charity care annually, and delivers more Medicaid-funded care than any other hospital in the state.

The School of Medicine ranks 14th overall in US News and World Report, and 10th in NIH funding. The School of Nursing ranks 15th nationally and is distinguished by programs that bridge people to alternative career paths. The research enterprise spans study of fundamental biological properties with long standing leadership in pharmacology, physiology, and biochemistry, evidenced by Nobel Laureates Sutherland and Cohen, that is paired with strengths in neuroscience, developmental biology, microbiology, and genetics. This discovery foundation is closely aligned with translational research to directly enable breakthroughs into the causes and treatment of disease. Recent strategic research initiatives aimed at further distinguishing VUMC include personalized medicine, therapeutic discovery and translation, and population health. VUMC is a national leader in building shared discovery science infrastructure with state-of-the-art platforms for mass spectrometry, imaging, drug discovery, genomics, structural biology, and informatics. All of which help investigators secure federal funds in a competitive environment and diversify their portfolio of financial support.

Mission

Vanderbilt University Medical Center aspires to shape the future of health and health care.

Aspirational goals

- Constantly innovate a healthcare services model that is systems-based and customized (personalized) to each individual
  - Engineer systems to do the right thing and get the right results every time, or to turn each short fall into iterative improvement
  - Take a holistic, anticipatory patient-centered approach
  - Meet the patient where they are and engage the patient and their support community as full partners throughout the continuum of care
  - Simplify and standardize throughput
- Create learning systems that produce leaders who learn in ways that match the next generation health care system and the pace of research discoveries
  - Equip people to lead the transformation of health care and discovery
  - Develop curricula that are effective, efficient and flexible
  - Standardize outcomes; individualize process
  - Manage career transitions to sustain productivity
- Nurture fundamental discovery and create a translational discovery architecture with national and global scale
  - Develop transdisciplinary research efforts to address grand challenges in biomedicine and advance fundamental discovery
  - Bring the full range of biological and social sciences to bear
  - Leverage computation, informatics and engineering to translate discovery directly into policy and practice
- Build and demonstrate a sustainable economic model for health and health care
Provide the highest health care value (cost/quality) using a **clinically integrated network**
Form novel partnerships with academia and industry to scale discovery and de-risk translation to products
Use analytics and modeling to guide program decisions
Transform the cost structure through **coordination** across the continuum and sharing of resources
Apply our experiences to global settings and borrow concepts in turn, to increase Vanderbilt sharing and learning about health care practices and efficiencies.

These goals reflect a decade of commitment to innovation - changing common perception of what is possible - by finding new combinations of care roles, process and technology that increase both quality and number of patients under care while reducing cost per patient per year. This commitment to innovation builds on a long standing culture of collaboration, decades of leadership in fundamental and translational research, and 20 years leadership in biomedical informatics.

VUMC has long standing alliances with **Meharry Medical College** (one of the few remaining minority medical colleges in the nation) and the **Tennessee Valley Healthcare System Veterans Administration Hospital**. These organizations each partner with full time Vanderbilt faculty and house staff who provide clinical care and participate in research and education programs. VUMC has recently entered into affiliation agreements with three community hospitals that share core values and a commitment to evidence-based medicine and health care information technology to develop care coordination programs spanning from southern Kentucky to northern Alabama. These affiliations will provide a platform for our efforts to improve the health of populations across the continuum of care, consistent with national goals toward US health reform. They expand our network to manage populations through innovations in care process, health IT, and multidisciplinary provider alignment. VUMC has also launched a new partnership with the **Scripps Research Institute**, **The Human Chemical Sciences Institute**, home to a broad range of collaborative activities pertaining to translational research at the interface of chemistry and medicine.

The School of Medicine is midway through transforming the MD curriculum from a sequence of courses to a system of learning called **Curriculum 2.0**. Acknowledging the explosion of information relative to medicine and the pervasive access to multiple information sources, an explicit goal of Curriculum 2.0 is to coach students to become aggressive learners, seeking to optimize care while leveraging all information resources (the healthcare team, healthcare information technology, diverse patient perspectives) in daily practice. Medicine constantly evolves; we believe this evolution is one of its greatest appeals as a career. Ours is a workplace in which every learner works and every worker learns. **Curriculum 2.0** is designed to launch our students into a life-long learning process that will extend well beyond their time on our campus. Vanderbilt graduates will be positioned to assume leadership roles in shaping the future of medicine.

We have closely aligned our graduate training initiatives with the research enterprise, and conduct re-iterative assessments of our graduate curriculum and training strategies. This has resulted in the launching of multiple new PhD programs in the past 5 years: the Human Genetics program, the Chemical and Physical Biology program, the Epidemiology program, and the Biostatistics program. Moreover, a new **Certificate Program in Molecular Medicine** is serving as a driving force to bring together basic and clinical researchers and will enable PhD students and fellows to gain direct medical knowledge and integrate their work with important clinical, disease-based areas. Expanding the reach of our biomedical graduate programs is also a strategic goal being enabled by the new Vanderbilt International Scholar Program. In sum, PhD biomedical students will be positioned to lead in research discovery. Vanderbilt also has initiated degree programs that build capacity across the spectrum clinical and translational research. **The Master of Science in Clinical Investigation (MSCI)** prepares students for careers in patient-oriented research, while **the Master of Public Health (MPH)** provides training in population-based research. Our **VA Quality Scholars** program also results in an MPH degree, but focuses on skill-building in quality and implementation science. Our **Department of Biostatistics** is active in all of our research education programs. Its faculty members teach required Biostatistics courses, and also offer their
expertise in all phases of research design, execution and analysis through daily “biostatistics clinics” and through individual consultation.

VUMC is committed to exporting innovation and has a track record leading consortial efforts. For example, VUMC has 1) led the development of a health information exchange for the hospital emergency rooms of three counties surrounding the city of Memphis with funding from the Agency of Healthcare Research and Quality, one of a few such efforts to document both quality improvement and cost savings, 2) been selected as the national coordinating center for all 60 of the National Institutes of Health (NIH)-sponsored Clinical and Translation Science Award Centers (CTSA). REDCap, designed by VUMC’s CTSA to capture and manage healthcare data for clinical trials, is now used by more than 200 institutional partners on 6 continents.

Vanderbilt also seeks to partner with global institutions that are agents of change in their home nations. We do not present a comprehensive list, but a few examples are the Shanghai Cancer Institute (Shanghai, China), Chinese Center for Disease Control and Prevention (Beijing, China), INFANT Foundation (Buenos Aires, Argentina), University of Zambia (Lusaka, Zambia), Vietnam National University (Hanoi, Vietnam), Universidad Peruana Cayetano Heredia (Lima, Peru), Aga Khan University (Karachi, Pakistan), National AIDS Research Institute of the Indian Council for Medical Research (Pune, India), Universidade Eduardo Mondlane (Maputo, Mozambique), and GHESKIO Foundation (Port-au-Prince, Haiti).
Measuring Progress toward our Aspirational Goals

The Five Pillars of excellence are the framework VUMC uses to measure progress toward our aspirational goals. They provide a balanced approach to our targets, evaluations, and communications. The Pillars are:

- **People**
  We nurture a caring, culturally sensitive, and professional atmosphere as we continuously invest in the individual and collective aspirations of our people

- **Service**
  Collegiality is a central characteristic of our culture and defines how we serve our patients, those we teach, and the local and worldwide community

- **Quality**
  We relentlessly pursue and measure ourselves against the highest quality performance in all areas, from patient care to research to education

- **Growth & Finance**
  We invest our resources in a manner that supports our long-term obligation to society; to achieve local, national and worldwide impact in accelerating discoveries and improving health

- **Innovation**
  We seek excellence and leadership as we advance our systems of care, educational practices and our commitment to discovery

We develop measurable goals in each pillar reflecting our aspirational trajectory as 3-5 year targets. Each year we assess our progress and advance the targets for the next year. Having advanced the targets, we next develop incentives and tactical plans to achieve these targets.

The Fiscal Year 2013 VUMC goals matched to The Pillars are:

- **People**
  - Reduce overall turnover
  - Increase resident pool diversity

- **Service**
  - Increase the percentage of new patients seen within 15 days
  - Increase team work
  - Increase timely completion of clinical summary

- **Quality**
  - Increase citations per publication relative rank among top 20 USNWR medical schools
  - Increase prestigious external awards and honorific society elections
  - Lower O/E mortality ratio
  - Lower acute myocardial infarction, heart failure and pneumonia readmissions
  - Increase use of evidence-based medicine as measured by use of electronic prescribing

- **Growth & Finance**
  - Increase VUMC results of operation
  - Increase VUMC expense reduction
  - Increase VUMC gifts
  - Increase sponsored research expenditures
  - Prioritize use of restricted funds

- **Innovation**
  - Increase technology transfer licenses/transfers executed
  - Manage down VU health plan cost per employee per month
  - Reduce length of stay O/E index
We cascade these summative VUMC-wide goals through the organization down to the individual level as tactical goals and measures of progress or operational performance.
Driving Strategy

Traditional strategic planning involves careful assessment of Strengths, Weaknesses, Opportunities and Threats. The resulting plans seek to guide organizations for periods of 5-15 years. The current economic, political and social climates require a more nimble process. VUMC is using an iterative planning methodology to respond to this challenge.

There are four categories of change that are a part of the organization roadmap.

- **Consolidation and Standardization**
  Increases efficiency and effectiveness by standardizing across the enterprise

- **Re-engineering**
  Redesigns key processes

- **System Innovation from Discovery**
  Innovates to change the perception of what’s possible and is fed directly by the research engine with the three-way foundation of basic, translational, and implementation sciences

- **Scale**
  Scales the techniques proven in the other three areas to increase volume and impact at the lowest cost

The medical center takes a portfolio approach to making choices about which initiatives to pursue in each category. Examples cited below, such as MyHealthTeam or VANTAGE, are explained in the sections that follow.
**System Innovation**

*Changing perception of what is possible*

System Innovation focuses on identifying opportunities to increase the measurable quality, while increasing the number of individuals being helped and reducing the unit cost. System Innovation is fed directly by the research engine with a three way foundation of basic, translational and implementation sciences. A system innovation project has the potential to:

- Dramatically improve health and health care
- Dramatically decrease cost to VUMC and/or payers without adversely affecting patient care
- Dramatically improve undergraduate, graduate and/or continuing medical education
- Dramatically reduce the time to discovery
- Rapidly translate discovery to standard clinical practice
- Grow Vanderbilt’s reputation as a trusted source

The hematologic malignancy **Diagnostic Management Team** (DMT) is an example of innovation. This DMT applies evidence-based standards for ancillary laboratory test utilization, informatics tools to improve evaluation of patient history, reflex pathologist-based test ordering in accordance with standards, summative reporting to guide therapy and monitoring and evaluation of the impact of these changes on test utilization and performance. Systematic collection of data on more than 2,500 bone marrow samples has provided new evidence with which these standards can be iteratively refined.

The following table contrasts the innovation to conventional practice.

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Conventional Hematopathology</th>
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<tbody>
<tr>
<td>Interdisciplinary team develops evidence-based testing standards for each condition &amp; phase</td>
<td>Clinician decides which individual tests to order at time of biopsy</td>
</tr>
<tr>
<td>Pathologist orders tests according to the standard while interpreting the biopsy</td>
<td>Pathologist interprets biopsy and lab generates test reports</td>
</tr>
<tr>
<td>Pathologist creates comprehensive report and interpretation once all required results are available</td>
<td>Clinician decides how to use the information as reports become available</td>
</tr>
<tr>
<td>The team translates basic scientific discoveries into standard testing algorithms and utilize evidence for iterative refinement of standards</td>
<td>Standard testing continues unchanged</td>
</tr>
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A six-month retrospective examination followed by a one-year prospective analysis showed DMT eliminates the 35 percent of tests that are not necessary while adding back the 10 percent of tests that would otherwise be missed. The net improves quality while annually saving Vanderbilt payors more than $1 million. Scaled to the national population the savings on these seven conditions alone would be approximately $500 million. These 7 conditions represent a small fraction of the opportunity to improve patient care, eliminate unnecessary tests, reduce errors, costs and length of stay, and improve use of diagnostic expertise and physician time. One example of translational science applied within the DMT framework is our study of the molecular basis for bone marrow failure. Our studies show that there is no evidence of large frame molecular abnormalities as determined by cytogenetics or FISH. Therefore, testing is not appropriate and other etiologies for marrow failure need to be discovered.

Other examples include:
- **My Health Team**: A model of team-based care that couples collaborative health care teams with health information technology to improve control of chronic conditions.

- **PREDICT (Pharmacogenomic Resource for Enhanced Decisions in Care and Treatment)**: Identify patients “at high risk” for receiving a drug where genotype changes response, assay genotypes important for variable actions of many drugs preemptively, store genotypes in the electronic record, provide point of care advice and track outcomes.

- **VPIL (Vanderbilt Program in Interprofessional Learning)**: Interprofessional working-learning teams that use a holistic approach and allow novice learners to add meaningfully to patient and population care.

- **BioVU (Vanderbilt’s DNA Bank)**: De-identified DNA samples linked to de-identified “avatars” abstracted from electronic health records to support population scale pattern recognition and hypothesis generation
Consolidation and Standardization

*Increasing efficiency and effectiveness*

Consolidation and Standardization cuts redundancies and other inefficiencies to reduce operating costs.

For example, VUMC’s Medical Economic and Outcomes Committee (MEOC) expands faculty oversight of purchasing decisions, employing medical evidence and cost comparisons to put purchasing decisions on a more reliable, objective basis. The MEOC Committees evaluate each product/device request utilizing internal and external benchmark data as it relates to outcomes, quality and financial impact. The MEOC process promotes safety, quality and cost-effectiveness, while protecting VUMC against powerful sales pitches, potential conflicts of interest and informal influences. MEOC has become a clearinghouse for VUMC supply utilization data with MEOC furnishing departments and individual clinicians with reports on their medical supply utilization rates compared both to internal and to national benchmarks.

The following table contrasts MEOC to conventional purchasing decisions:

<table>
<thead>
<tr>
<th>MEOC</th>
<th>Conventional purchasing decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise wide decisions</td>
<td>Decisions made on a department level</td>
</tr>
<tr>
<td>Contracts negotiated by experts</td>
<td>Individual departments negotiated contracts; most had little experience in contract negotiation</td>
</tr>
<tr>
<td>Impact to quality indicators such as decreased LOS, decreased mortality/morbidity and impact to the community</td>
<td>Little or no evaluation of impact beyond the department</td>
</tr>
</tbody>
</table>

Excluding capital purchases, VUMC currently spends in the neighborhood of $350 million per year on medical supplies, equipment and services. The figure would be significantly larger without the consistent and thorough evaluation of product claims, medical evidence and market information provided by MEOC.

MEOC provided more than $9 million in savings for fiscal year 2012 and is projected to save VUMC more than $7.4 million in 2013.

Other consolidation and standardization examples include:

- **VANTAGE** (Vanderbilt Technologies for Advanced Genomics): Co-locating and expanding four existing core facilities and BioVU. VANTAGE will include the Genome Sciences Resource, which merged the DNA Sequencing Facility, Functional Genomics Shared Resource and Genome Technology Core
- Merger of the Departments of **Pathology and Microbiology & Immunology**: The merger will allow closer alignment and collaboration between the faculty and students, and promises a more efficient and effective approach to translation of discoveries to practice
Reengineering

*Redesigning processes to reduce error and waste*

Reengineering is the systematic redesign of processes to simplify, reduce waste and reduce error through techniques such as lean enterprise and Six Sigma.

Vanderbilt Medical Group’s [Access Redesign](#) is an example of reengineering. The redesign supports the growth of VUMC by helping clinics gain efficiency and optimize capacity. The initial focus has been on improving patient access, thereby improving both clinical quality and patient satisfaction. Process engineers from the VMG Performance Improvement Office undertake lengthy engagements with each clinic to understand work demands and to design and implement wide-ranging solutions. Typical changes include creation of call centers to centralize and standardize handling of incoming telephone calls and protocol-based nurse telephone triage, modification of providers’ appointment scheduling templates to increase access and simplify scheduling, adoption of electronic work cues to standardize pre-appointment work, and electronic tracking of patient flow to support ongoing analysis and improvement.

The following table illustrates differences between access redesign and conventional access:

<table>
<thead>
<tr>
<th>Access redesign</th>
<th>Conventional access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call centers consolidate resources</td>
<td>Each clinic handled its own calls</td>
</tr>
<tr>
<td>Appointment scheduling templates</td>
<td>Information and scheduling was clinic-based, making it difficult to coordinate patient care across clinics</td>
</tr>
<tr>
<td>Electronic work queues to standardize pre-appointment work</td>
<td>Ad-hoc systems focused on individual clinic requirements creating variability between clinics</td>
</tr>
<tr>
<td>Electronic tracking to make patient flow visible</td>
<td>Systems were not designed to determine optimal capacity or scheduling, which often translated to long waits at the clinic to be seen</td>
</tr>
</tbody>
</table>

A one-year analysis (from second quarter of fiscal year 2011 to third quarter of fiscal year 2012) showed new patient access within 15 days improved from 56 percent to 63 percent. This resulted in an increase of 17 percent growth in total patients and 20 percent increase in new patients seen within a quarter compared to second quarter, fiscal year 2011, for Physician, NP and other defined provider types templates. The adjusted utilization of existing template capacity improved 9 percent overall. Our rework of appointments declined approximately 10,000 appointments per quarter. Our physician unavailable rates have improved, trending downward by roughly 5 percent, since active measurement was put into place.

Other reengineering examples:

- **Perioperative Redesign Project:** The project is geared to improving the continuum of care by decreasing delays in the OR holding room, increasing first case on-time starts and improving overall patient experience.
- Productivity and Technology support across School of Medicine departments: Faculty and staff pick from a menu of role-based computing and communication solution sets. Productivity and Technology Specialists guide them to effective work practices and the institution standardizes the tools, service and infrastructure to deliver the solution sets.
- **CTSA Design Studios:** Uses the resources of the CTSA (National Institutes of Health funded Clinical Translation Science Award) to assemble an interdisciplinary team of faculty to hear a brief presentation of a colleague’s and participate in a facilitated discussion of critiques and potential
modifications. Provides critical input during formative stages while the designed can be improved instead of waiting for review after it is complete.
Scale
Growing volume and impact at the margin

A system is “scalable” if the volume it handles can be increased with minimal increase in variable cost. Put differently, cost per use increases much more slowly than the number of uses.

Within an integrated organization structure, VUMC joins individuals with deep knowledge ranging from all aspects of biomedicine through the social sciences, cutting-edge discovery innovative and care facilities. This environment is a “real work laboratory” to work out innovation, standardization and re-engineering. This unique environment has a higher cost structure than community hospitals or more narrowly targeted industrial research organizations which do not have VUMC’s breadth and depth. To scale what we learn – to bring its full benefit to society - we “re-package” what we do so that others can apply it within their sphere and cost structure. By partnering with others we scale our results to the region, nation and world.

<table>
<thead>
<tr>
<th>Approaches that “scale”</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence throughout the nation’s health system</td>
<td>Own and operate</td>
</tr>
<tr>
<td>Translate discovery into action</td>
<td>Discover and publish</td>
</tr>
<tr>
<td>Support learning for life</td>
<td>Educate &amp; cultivate for philanthropy</td>
</tr>
</tbody>
</table>

Our work toward a Clinically Integrated Network is an example. It attempts to achieve scale by enabling otherwise independent hospitals and practices to work together. First, we seek to leverage common infrastructure to reduce unnecessary variability and save cost. Second, we work to improve outcomes and reduce utilization by embedding multi-disciplinary evidence-based care pathways across the participating organizations. Third, we measure the improvements in order to demonstrate effectiveness at a population scale.

- **Stage one** - We enter into relationships with a number of complementary hospitals and practitioner communities who share our commitment to high quality care.
  Many of the employees of the affiliates live in areas serviced by other affiliates. By making each affiliate a preferred provider in each other’s health plans we reduce the cost for both employees and plans, while strengthening each affiliate in their local area. The plans then begin to share infrastructure to drive down administrative cost and the affiliates work together as a network for other employers.

- **Stage two** - We drive quality and efficiencies to greater scale by developing new support methods for evidence-based practice across disparate care settings.
  The affiliates share an interest in care coordination and evidence-based medicine. Together they can develop new means of coordinating care through improved lines of communication, as well as new organizational forms and governance structures. An essential element will be the development of a single virtual medical record for each patient; this will allow authorized providers access to the data they need and let them contribute as necessary, while driving best practices with guidance toward common quality metrics.

- **Stage three** - We demonstrate improvements in clinical output and quality at quantifiably lower costs.
  This demonstration will create a powerful negotiating position as we seek to care for the employees of major regional organizations. A large and diverse collection of rural and urban providers, properly coordinated and managed, will ensure every provider practices at the top of their license, every facility runs at capacity managing the types of conditions to which it is best suited, and every patient receives the best care possible.
Other examples include:

- REDCap (Research Electronic Data Capture): A secure, Web-based application for building and managing online research databases that serves more than 20,000 research end-users at 225 academic and non-profit institutions across six continents
- CTSA Coordinating Center (VICTR), which aims to harness the collective research energy on a national scale and accelerate the translation of discoveries to clinical practice
Additional Reading
This guide summarizes Vanderbilt’s overarching strategy. Detailed plans are developed within this overarching framework at the level of entities, institutes, centers and departments. This is a sampling of those plans (click titles to link to documents):

Vanderbilt University Medical Center
- 2011 Factbook
- 2011 Financial Report
- Strategy Themes
  - Personalized Medicine
  - Becoming Human
  - Vanderbilt ‘Outside’
    https://www.mc.vanderbilt.edu/vunet/vumc.php?site=strategythemes&doc=25131
  - http://globalhealth.vanderbilt.edu/
- Informatics
  - Strategic Plan and Roadmap to 2010
  - Strategic Plan July 2006 Progress Report and Roadmap to 2012

Research Enterprise
- 2006-2010 And Beyond: Vanderbilt University Medical Center Research Enterprise Strategic Plan
  Biomedical Science Advisory Board
  - Agenda
  - Powerpoints
  - Critiques
- The Human Chemical Sciences Institute
- Institute for Chemical Biology Plan for 2012-2017
- Vanderbilt Brain Institute Plan
- Vanderbilt Center for Neuroscience Drug Discovery
- The Center for Structural Biology Plan

Education Enterprise
- Vanderbilt School of Medicine
  - Mission
  - Curriculum 2.0
    - Curriculum 2.0 Overview
    - Curriculum Day
  - https://medschool.vanderbilt.edu/mph/
  - http://www.mc.vanderbilt.edu/msci/
Education Enterprise (continued)

- [https://medicine.mc.vanderbilt.edu/im_vafellowship](https://medicine.mc.vanderbilt.edu/im_vafellowship)
- [https://medschool.vanderbilt.edu/biostatistics/](https://medschool.vanderbilt.edu/biostatistics/)

- Graduate school
  - [Certificate Program in Molecular Medicine is serving as a driving force to bring together basic and clinical researchers](https://medicine.mc.vanderbilt.edu/im_vafellowship)
  - [Vanderbilt International Scholar Program](https://medschool.vanderbilt.edu/biostatistics/)
- [Vanderbilt School of Nursing Mission/Vision/Values](https://medschool.vanderbilt.edu/biostatistics/)

Clinical Enterprise

- Vanderbilt Anticipatory Care Team Report Out
- Vanderbilt Medical Group Strategic Plan