

# Achieving Greatness

## Strategic Plan for Fiscal Years 2005–2009

### Vision

The Feinberg School of Medicine is on course to achieve the vision—developed with its academic medical center partners—of moving “into the forefront as one of the nation’s pre-eminent medical schools as measured by the excellence of our students and faculty members, the success and innovative nature of our research and educational programs, and the quality of clinical care we provide to patients.”

The last five years were marked by investment, growth, and improvement. During the next five years,

- substantial new research space will be online and productive.
- clinical facilities will be further expanded and modernized.
- new departments, centers, and institutes will be created.
- the school’s sesquicentennial will be celebrated.
- new leadership will be in place at several Northwestern academic medical center institutions.



Our medical school—the 30th oldest medical school in the country—will observe its sesquicentennial in 2009. Beyond being a celebration of our rich history and longevity (more than one-third of U.S. medical schools were established in the last 40 years), this occasion provides an opportunity to reflect on the role of a leading academic medical center for the coming decades and to position ourselves for that challenge and privilege.

### Strategic Approach

The promise of academic medicine has never been greater. Society's enormous investment during the last half-century has fueled extraordinary progress in the prevention, diagnosis, and treatment of human disease and provided remarkable insight into human biology. Previously unthinkable advances in patient care and the overall health of society are close at hand. At the same time, the challenges to academic medicine have never been greater, requiring new approaches to education, research, and clinical care while adapting to sweeping changes in the economic, legislative and societal landscape.

Our need to grow runs counter to prevailing economic trends. Health care funding, philanthropy and support for research are under pressure. Costs are rising for regulatory compliance, malpractice insurance, and increasingly sophisticated equipment and facilities.

Our institutional resources will be targeted to

- building academic programs to maintain or achieve national or international prominence.



- building programs in other key areas in which an academic medical center must be active to incorporate major advances into its curricula, research, and clinical practice.
- addressing deficiencies or problems within our enterprise, particularly in the physical and administrative infrastructure.

## Major Strategic Goals FY2005–09

1. Ensure a sustainable, shared commitment to academic excellence throughout our academic medical center.
2. Create educational opportunities that build upon and nurture the leadership interests and abilities of our students and faculty members. Recruit and support an increasingly outstanding complement of students, residents, and faculty members.
3. Recruit 100 net new tenure track faculty scientists. Double the size of life sciences graduate training programs.
4. Encourage departments, centers, and institutes to invest in research and education programs that build upon our significant interdisciplinary and clinical strengths.
5. Develop the infrastructure to support current programs and planned growth including
  - » completing the productive occupancy of more than 225,000 net square feet (nsf) of new and renovated research facilities.
  - » planning construction of a 16-story tower for the Robert H. Lurie Medical Research Center of Northwestern University.
  - » completing more than \$62 million in planned capital improvement projects
  - » supporting the selection, design, and implementation of major infrastructure improvements at Northwestern University.
6. Generate enthusiasm for the school's future on the occasion of its sesquicentennial. Continue to develop an enterprise that anticipates, embraces, and leads change.



## Long-Range Vision

### Education

Since education is the defining mission of a medical school, we are committed to providing outstanding and innovative educational programs for physicians, other health care providers, and scientists to meet the needs of patients, families, and society. Significant resources will be devoted to innovation in curricular design, rigorous evaluation and improvement of educational outcomes, faculty development, and information technology. All faculty members must contribute in some measure to the educational mission. The school should align sources and uses of revenues for educational programs and must procure additional resources to support excellence in education.



### Research



Northwestern will become one of the top 20 research-intensive medical schools in the United States, with the faculty, funding, and infrastructure necessary to sustain a top-tier research enterprise. The school and its academic medical center affiliates will strengthen existing capabilities and establish new programs in strategically important research areas. The research enterprise should enhance the school's educational programs and contribute to the quality and effectiveness of patient care services in our academic medical center.

### Clinical Affairs

The prominence of our academic programs attract distinguished physicians and investigators to our faculty, excellent residents and fellows to our training programs, and outstanding students to our school, thereby creating a stimulating professional environment where the ethic of service to patients and the community is informed by the best that science and medicine have to offer. Faculty members will continue to provide the highest quality patient care and maintain the highest standards of ethics and service to patients. The school will maintain a leadership position by leveraging the value that its academic mission provides to the patient care enterprise.

### Faculty

The quality and success of the institution depend on our ability to provide the intellectual environment and resources necessary to attract and retain an outstanding faculty and on the continuing commitment of the faculty to our academic mission. The school must maintain a well-balanced full-time and contributed services clinical faculty. Faculty members should participate in setting and be held accountable for institutional goals. Leadership and management skills should be sought and developed in faculty leaders.



## Infrastructure

The school must maintain the space, facilities, support services, and technology base necessary to sustain its programs. More and better research and animal facilities, information and administrative systems, and support services are necessary. We have a responsibility to ensure that resources are used productively to foster faculty and student achievement.

## Leadership and Management

We must continue to evolve an academic medical center culture and strategies appropriate for our environment and attract the resources necessary to realize our bold vision for the future.

# Building Excellence

We have significant opportunities to create programs of recognized national leadership during the next five years while strengthening existing outstanding programs. Many department- and center-based programs are at or well within reach of prominence, mostly in specific, focused clinical or research areas. Their development should continue to be fostered while we pursue the institutional opportunities for excellence described below.

## Education

Northwestern has always been well regarded for educating medical students and residents. As an early participant in preclinical curriculum reforms during the 1990s, the school brought about major changes by building infrastructure and recruiting key faculty educators. This resulted in the creation of several programs in which the medical school is widely recognized as among the nation's finest, notably in clinical skills teaching and assessment, health communication, and medical humanities and bioethics. As a leader in medical education reform, the Feinberg School has both an opportunity and a responsibility to expand educational programs in evidence-based medicine and patient safety to help set the direction of medical education for years to come. Our affiliation with the Rehabilitation Institute of Chicago, long regarded as the finest such institution in the nation, affords us a unique opportunity to create educational programs addressing disability.

[Read about National Directions in Medical Education in the Sidebar Section](#)

Although the Feinberg School has not historically enjoyed a particularly diverse body of students or faculty members, it has made significant progress, recently achieving a 25 percent minority matriculation rate through the regular admission pathway. Our location in one of the most diverse population centers creates both an opportunity and an imperative to further develop themes of cultural diversity in medicine in educating the next generation of physicians.

## Leadership

Leadership experience always has been a factor in our recruitment of students, residents, and faculty members. As our education, research, and faculty development activities continue to evolve, we will enhance and develop leadership skills and interests by creating formal and informal educational

[Read about Diversity: Opportunity and Imperative in the Sidebar Section](#)

opportunities. The school and some departments already support programs developing innovative approaches to medical and clinical education. By creating an institute, academy, or other unit that spans departmental boundaries, we can nurture collaborations among committed educators and scholars, create opportunities for faculty development, foster new initiatives, and recognize superior teaching. Similarly, we will support and enhance department initiatives that use information technology creatively to build new educational environments and student tools, especially in the promising area of simulation in medicine and medical education.

## Research

Achieving pre-eminence will require the Feinberg School to exceed its impressive growth in research during the last decade by sustaining research growth rates two to three times those forecast for the NIH budget. A substantial portion of the 100 net new faculty investigators we plan to recruit should be in areas in which the school is or can be nationally recognized for excellence by 2009. We will gauge our success by a variety of measures, benchmarking our progress against the best institutions and against ourselves. Some measures will be longstanding, such as faculty honors or types and amounts of extramural grant activity; some will be more recent, such as the impact of scholarly publications; and some will be novel, such as whether the faculty members who choose to leave Northwestern do so to pursue leadership positions at top institutions.



The completion of the initial phases of the Lurie Research Center represents a historic opportunity for the Feinberg School. Space in the new facility is being assigned programmatically rather than by department, a significant departure from common practice in academe and one that we believe will allow for significant progress by building outstanding programs through unique collaborations and synergies. During the next five years, we will complete the occupancy of the building and plan for construction of an additional tower. This will require the recruitment of at least 20 net new tenure track faculty members per year.

The recruitment of more than 100 new faculty members will allow leaders of departments, centers, and institutes to pursue plans for strategic development, build areas that leverage our extensive clinical strengths, and attract additional national program development and center funding. The significant expansion of the research enterprise affords us an opportunity to use recruitment as retention, bringing collaborators here for our most promising faculty members. We will continue to use innovative recruiting models, such as the recently successful supradepartmental search committees, to augment department efforts at attracting outstanding faculty members.

The areas particularly ripe for investment to achieve a recognized position of national excellence during the next five years are

- reproductive biology and molecular endocrinology;
- neurodegenerative disease; and
- cell motility, cytoskeleton, and molecular motors.

Space in the Lurie Research Center and elsewhere on the campus will aid recruitments in these areas.

The University also will be investing in systems and infrastructure supporting the growth of the entire life science enterprise. Working with the leaders of the University and our affiliated hospitals, we will develop a cohesive, comprehensive life sciences research strategy that leverages all our investments to the best

[Read about the Feinberg School's Research Direction in the Sidebar Section](#)

advantage. We also will continue to hone our internal processes for evaluating research priorities as our environment evolves.

Recognizing both the promise and challenge of translational research, the NIH has made the focus of its recent Roadmap accelerating the translation of basic discoveries to clinical use. Northwestern may be uniquely positioned, with a breadth of programs from molecular to population studies and a strong culture of interdisciplinary collaboration, to build interesting and innovative linkages and programs that could catapult us toward a leadership position regionally and nationally.

[Read about obesity as An Opportunity in Translational Research in the Sidebar Section](#)

Many areas exist throughout the academic medical center where translational research activities could be built including obesity (linking endocrinology, genetics, nutrition, and clinical practice across the University and in several Feinberg clinical departments and affiliated hospitals); rehabilitation and regenerative medicine (linking RIC to NU expertise in neurology, stem cells, nanoscience, and biomedical engineering); reproductive and developmental biology (linking NU with Northwestern Memorial Hospital's Prentice Women's Hospital and Children's Memorial Hospital); and other disease-related areas such as cancer, neurodegenerative disease, diabetes, aging, and sleep. The broader Regional Translational Research Consortium of leading local research medical centers may provide other opportunities as well. The creation in FY2006 of a leadership position in clinical and translational research represents an important step in enabling the school to build upon historical and emerging strengths, such as our longstanding General Clinical Research Center and Medical Scientist Training Program (MSTP), both supported by NIH, and explore unique possibilities and collaborations avenues across the academic medical center and University.

## Recruitment

Our recruitment pattern has historically been balanced with respect to rank but with a tilt toward junior faculty members. During the next five years, we must move toward a truly balanced approach by recruiting more established investigators. The Feinberg School has only rarely recruited "superstars" to the faculty. In light of the competitive environment, we are re-examining this approach. While recruiting a corps of outstanding junior faculty members represents the future of the institution in many respects, we are examining the implications of a shift in focus to build, rather than grow, more strength at the senior ranks. We will continue our impressive recent expansion of the combined MD-PhD program, an important indicator of the quality of our research and education environment.

[Read about A Sellers' Market for Research Talent in the sidebar Section](#)

## Clinical Services

A major strength of our academic medical center is the quality of care provided by the clinical affiliates. We are committed to fostering clinical innovation and providing the best patient experience, creating and disseminating new knowledge, cultivating future leaders, and applying our combined resources and expertise to accelerate recognition of Northwestern as a leading, contemporary academic medical center.

The medical school can lead the academic medical center institutions in developing collaborations across diverse groups of physicians and surgeons. More than 2,000 active clinicians hold faculty appointments in the Feinberg School and practice throughout our academic medical center. Nearly half are members of three major multispecialty faculty practice plans. The breadth and complementary skills of these faculty members represent an enormous opportunity to create more optimal systems for delivering care and to advance initiatives in patient safety and clinical research. Significant structural, legal, and cultural barriers exist to creating more unified clinical, research, and technological collaborations across the faculty. But with the tremendous potential for achieving pre-eminence and better serving our patients, faculty members, and students, we will create a dynamic environment that leverages the skills



and strengths of clinicians and information systems, links basic science and health services research to clinical practice, and provides exemplary role models at the leading edge of medical practice. The Northwestern Medical Faculty Foundation (NMFF), the school's primary full-time faculty practice plan, is one linchpin of our enterprise. NMFF provides a rich environment of best practices ( of interest to patients), outstanding clinical experiences for our students and residents, a laboratory for the translation of proven therapies into clinical practice, and a magnet to recruit outstanding faculty physicians. It also provides significant reliable, recurring, and unencumbered financial support for the academic enterprise. We will make every effort to ensure NMFF's continued viability and growth.

Many of our residency and fellowship programs are already recognized as among the nation's best, and the comprehensive, integrated structure of the McGaw Medical Center enables Northwestern to create innovative graduate educational programs. Exciting opportunities also exist to develop organized comprehensive treatment centers and build linkages for translational research. One of Northwestern's greatest strengths lies in its tradition of investing in interdisciplinary collaboration in scholarship and teaching. The breadth and diversity of expertise throughout the University, coupled with a culture of collaboration, provides fertile ground for developing innovative approaches and solutions to the major problems of the day.

### Fund Raising

Campaign Northwestern ended in 2003, having raised more than \$520 million for the medical school, surpassing its \$400 million goal. The current fund-raising environment is quite competitive, with several of our affiliates and other local institutions in capital campaigns. Nonetheless, we believe that our vision, success, and potential create a fertile ground to plan a new capital campaign for the Feinberg School. We will work with school leaders, faculty members, and the donor community to focus our strengths and opportunities within the school's broad, interdisciplinary framework for growth and excellence.

## Expanding Our Presence

A medical school must have myriad programs to properly serve its constituents and remain at the forefront of medicine. Five of our focused areas have been targeted for significant growth: stem cell biology, genetics, regenerative medicine, imaging, and cardiovascular disease and treatment. Recruitments to these areas are tightly linked to our plan to productively occupy the Lurie Research Center, with additional space in the McGaw Pavilion and Tarry Building available to further build our presence in these areas. Progress has been made in recruiting researchers as well as redirecting current researchers to stem cell and genetic research, but recruiting leaders for a stem cell institute and the Feinberg Cardiovascular Research Institute are critical to our further success.

Expansion will not only provide a research presence and a breadth of support for potential collaborators throughout our academic medical center but also maintain a capability to incorporate advances into clinical practice and medical education. Key recruitments and investments in these areas may enable us to seek national distinction during future planning cycles.

The influx of more than 100 faculty members creates an opportunity to evaluate our structure both programmatically and administratively. Research is increasingly interdisciplinary and collaborative, and historical department distinctions are blurring. Data from the top research medical



schools show that no uniform structure and organization exist nor even a uniform set of departments. This suggests that we can tailor our organizational structure to further develop a culture specific to Northwestern.

Departments should be kept a manageable size so that chairs (who are often active investigators themselves) can engage in mentoring and faculty development in addition to their administrative duties. This manageable size will also create the best infrastructure to seed collaborations between colleagues. New academic departments, department substructures, and centers and institutes will be necessary. Potential departments in the basic sciences include genetics, biochemistry, immunology, and neurosciences; cross-campus departments also will be explored. Evolving models of patient care delivery will likely result in reorganization of the clinical enterprise as well as the structure of clinical departments.

The Feinberg School has implemented a new recruitment model to facilitate its significant expansion. Supradepartmental search committees augment—not replace—traditional department-based efforts. They are charged with recruiting at least five outstanding faculty members, at any academic rank and regardless of their home department, in research areas linked specifically to the school's strategic research priority themes. Our recent success indicates that these committees will continue to be an important tool for recruiting faculty members by discipline and strategic need.

Our defining mission remains education. We will incorporate more skills-based assessments, track student progress more comprehensively, continue our review and improvement of each curricular component, and improve the measurement of educational outcomes. In addition, we will strengthen our education programs in ethics and professionalism, cultural diversity and social context, and the use of information systems and other technologies to enhance patient care and safety. Since understanding the principles of scientific research is critical, medical students will be encouraged to undertake a research experience. Goals include offering a research thesis experience to medical students and increasing the percentage of students who wish to pursue this option.



The strong trends toward internationalization should drive the school and its academic medical center partners to evaluate what it means—and what it takes—to have a global presence. We will build on our existing partnerships to further expand international educational opportunities.

Providing care to indigent and underserved populations is essential to educating medical students and residents and serving the broader community. A cornerstone of Northwestern's responsibility in this area is its longstanding affiliation with the VA medical system. Since the Department of Veterans Affairs closed the Lakeside inpatient facility in 2003, the school has been exploring relationships with other local VA hospitals and clinics. We are seeking affiliations that have a strong commitment to underserved populations so that students and residents may maintain and develop their commitment to community service. We have the opportunity to develop a broad-based initiative on the needs of ethnic and cultural minorities throughout all of the hospitals and educational sites of the McGaw Medical Center.

The rapid pace of change of information technology requires significant investment to keep up. An expanded presence in several areas could lead to strategic information technology advantage. By developing special capabilities for bioinformatics—such as clustered computing, massive storage, and perhaps even a separate network—we can position ourselves competitively for the era of post-genomic multifactorial analyses. We can also greatly enhance the information environment for faculty members, with expanded user support and smart search tools.

## Shoring Up the Foundation

The Feinberg School has advanced significantly in recent years. We have made major investments and commitments to construction and renovation, faculty recruitments, curricular reform, and financial management. These efforts will continue to result in our substantial growth in size and stature. However, our physical infrastructure, administrative systems, support services, and culture have trailed that growth. The next five years will see activity that brings the entire enterprise to the stature we expect at Northwestern. An important part of our strategic approach is to invest in addressing our growing pains and in areas where we have deficiencies, particularly those that support faculty members and students.



During the past several years, we have admitted a national medical student body with some of the highest credentials we have seen. We will refine our admissions process to continue recruiting a more diverse, more national student body, of even higher caliber, from a wide range of undergraduate schools. Our goal is to compete with the best medical schools for the best and most desirable students, as measured by the number of applicants jointly accepted by the Feinberg School and the nation's top medical schools who then choose to matriculate here. While we have made progress in recruiting a more diverse medical student class through our regular admissions pathway, we need to improve the diversity of students admitted through the Honors Program in Medical Education (HPME) and the Medical Scientist Training Program, which leads to both MD and PhD degrees.

The HPME, a combined seven-year BA-MD program, has historically accounted for up to one-third of the medical school class with approximately 60 matriculants per year. The school would like to reduce the program to 20 students per year, with 12 to 15 admitted in the standard manner as freshmen and 5 to 8 admitted as sophomores. This will help address some deficiencies related to academic performance of some HPME students and improve the overall diversity of the medical school class, since few minorities enter on this pathway. We recognize, however, that the HPME is a joint program with the Evanston campus undergraduate program and any changes must meet our collective needs.

The medical school will complete the overhaul of our model of providing financial aid from a complex system of debt caps and subsidies to grants-in-aid and at the same time improve student support services. The University recently announced plans to phase out professional student housing on the Chicago campus, prompting the school to review subsequent increased needs for secure, around-the-clock study space and wireless access. We will further incorporate into our educational programs information technology for learning and evaluation of educational programs. We will comprehensively assess the impact of technology on medicine and therefore on the curriculum and the use of resources, such as the Galter Health Sciences Library, Learning Resource Center, and Weinberg Medical Informatics Training Center, with the goal of making optimal use of technology in medical education.

Changes in the financing and delivery of health care during the past decade reduced payments and moved much patient care into the ambulatory setting. This has placed significant pressures on faculty members to increase their clinical productivity, often at the expense of their time commitment to education. We will devote substantial effort to develop and support faculty members in their roles as educators. We will aspire to create incentives for high-quality educational contributions that go beyond simple economics to develop a culture that values educators and provides opportunities to enhance the skills of faculty members and residents in teaching medical students.

With more than 3,000 faculty members and a decentralized organization of more than 30 departments, centers, and institutes that span multiple organizations (medical school, clinical practices, and hospitals), the school faces considerable challenges to providing broad-based faculty support. The institution, in large measure, is defined by its faculty. With increased competition for the very best faculty members, we

will create an environment that marks the Feinberg School as an outstanding place to build and spend one's career. Beyond competitive salaries, the key factors to attracting and retaining high-quality faculty members include intellectual quality of life, facilities and infrastructure, vibrant life in the Chicago area, and the school's leadership and clarity of vision. We can improve the environment for faculty members by raising the bar for staff quality and performance through recruitment, development and training.



We need to improve efforts in communicating our vision and strategies, discussing important issues, and emphasizing the common goals of the academic medical center institutions. The significant expansion of the research enterprise affords an opportunity to use recruitment as retention, bringing collaborators here for our most promising faculty members. We can improve the environment for faculty members by raising the bar for staff quality and performance through recruitment, development, and training. Considerable variation in departmental practice exists in faculty orientation, mentoring, and training in such areas as grant writing, compliance issues, clinical research, and philanthropy; school-led initiatives may help with access and consistency. These will be led by a newly

appointed associate dean for faculty development. Similarly, continued refinement of incentive compensation and appointment terms may help further align institutional goals with department goals and improve equity across departments, particularly for PhD scientists. Northwestern has a rich history of interdisciplinary collaboration in education and research—a major focus for us going forward—and we need to ensure that the mechanisms for sharing appointments, resources, and costs across the University allow us to maintain fertile ground for innovative partnerships.

Improving the overall culture and infrastructure for research is also vital to recruiting and retaining high-quality faculty members. We plan to increase to 50 per year the number of matriculating graduate students in the Integrated Graduate Program in the Life Sciences, more than double the number at the program's inception. Other initiatives we need to undertake include

- improving and expanding shared and core facilities for research.
- refining processes for identifying when new core facilities are needed and when old ones have outlived their usefulness; maintaining competitive rate structures and subsidies for core facilities.
- encouraging efforts in translational medicine and technology transfer.
- making significant progress in two areas in which we have underrecruited since the last strategic plan: functional imaging and health services research.

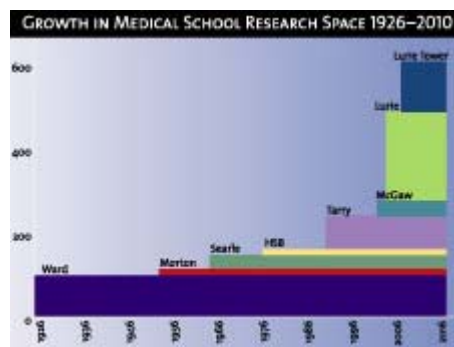
The regulatory and legal environment will increasingly influence institutional and individual actions. Our internal culture must evolve to embrace more stringent safeguards for research subjects and staff, improve relationships with our funding agencies, and ensure compliance with regulatory oversight in research and patient care.

For several years research growth at Northwestern has proceeded far ahead of changes to its systems for compliance and to the culture for research. Spurred by significant government investigations and findings, the University is making serious investments in the administrative infrastructure. The Feinberg School will play a major role in defining, developing, and supporting these efforts to improve the overall administrative environment for research specifically and management generally. While efforts are under way to upgrade systems for effort reporting and financial and personnel management, we could also create a strategic advantage by developing true enterprise data and decision support systems.

## Capital Improvements

During the last strategic planning cycle, the medical school embarked on a major capital improvements program, including the construction of more than 175,000 nsf of research space in phases 1 and 2 of the Lurie Research Center at a cost of \$200 million and more than \$50 million in renovation projects for education facilities, research space, administrative offices, and building systems improvements.

During the next five years, we will complete the construction and productive occupancy of the Lurie Research Center (see appendix) and plan for construction of phase 3, a 16-story addition that will house up to 90 new faculty investigators. We will continue to renew and replace our buildings and systems, and complete renovation and consolidation of research space in the existing complex. Space is a precious, limited resource, and we will improve and make more transparent our processes for evaluating and allocating space throughout the enterprise. A new parking structure will be built adjacent to the Erie lot, bringing more than 1,000 new spaces to campus.



Our major strengths are the quality of the University, teaching hospitals, and practice plans and a shared vision of a pre-eminent academic medical center at Northwestern that will benefit us all as well as the broader community. But ensuring a sustainable, shared commitment to academic excellence throughout separate institutions with sometimes disparate goals can be a challenge. The collective leadership of our academic medical center must be innovative and flexible in developing and maintaining the resources, infrastructure, and culture necessary to achieve our shared vision.

## Appendix 1 Strategic Assumptions and Implications

The development of a set of basic assumptions is fundamental to any planning effort. Assumptions are an important tool to communicate current realities and likely trends, they identify factors that frame and influence our choices, and their implications provide a framework for our goals, objectives, and strategies.

1. The Feinberg School of Medicine is committed to aggressive growth in size and stature as it moves into the ranks of the nation's very best medical schools. This commitment to growth now runs counter to prevailing near-term economic trends. These trends include pressure on philanthropy, public and private funding of clinical care, costs of regulatory compliance and malpractice insurance, and federal support of basic research.
2. Society's investment in biomedical research is paying off with a revolution in medicine. Increasingly powerful tools are creating new opportunities to prevent, diagnose, treat, and cure. Our ability to use these tools to greatly improve the effectiveness of patient care depends on overcoming issues in the financing and delivery of, and access to, health care services.
3. The rapid pace of change in biomedical science, technology, and medical practice presents responsibilities and opportunities across all our missions: to modify how we practice medicine and care for patients, to reduce medical errors, to remain on the cutting edge of research, to develop outstanding educational programs that prepare physicians to keep pace with ever-expanding frontiers in science and medicine, and to teach patients and the general public to improve overall health.

4. The plans for accelerated growth of the school pose significant challenges to institutional leadership and management. Improvements in accountability are necessary to enable us to simultaneously retain our decentralized character and balance the achievement of individual, departmental, and institutional goals. We must develop a culture of managing growth, which includes the will to end unproductive programs or nonperforming investments and even decline external support in areas not consistent with our vision for growth. The department structure and roles of chairs will evolve. Systems and decisions must provide the necessary information, incentives, and disincentives.
5. Significant changes—and constraints—in the scope and direction of federal funding of biomedical research are likely in response to competing governmental priorities and the prevailing economic and political climates. Historical patterns of the types of research funded and types of awards made will no longer hold, and while some areas will grow, many traditional areas and funding mechanisms will not. Several new factors should be considered, such as political pressures favoring disease-based applied research over basic research, biodefense initiatives that have reduced overall NIH funding available to other areas, and the new NIH Roadmap, which has outlined new initiatives and directions.
6. We are faced with a range of choices in research directions and must continually evaluate the intersection of our strengths and needs, areas of growth in scientific impact, and the moving target of funding opportunities. Most importantly, we must strike a balance between the historical approach of opportunism and a need to establish strict priorities and a measured approach for institutional investments in new and current research and associated infrastructure. We need to refine our analytical framework for selecting our investments and improve our processes for communication and collective decision making about the inherent trade-offs.
7. The regulatory and legal environment will increasingly influence institutional and individual actions. Our internal culture must evolve to one that embraces, rather than tolerates, more stringent safeguards for research subjects and staff members, and compliance with regulations in research, admissions, and recruitment.
8. In a break with historical tradition, we must implement an aggressive faculty recruitment and retention strategy. A significant number of recruitments will be driven by programmatic rather than departmental needs and mechanisms. The best way to overcome administrative and cultural barriers to this evolution is for new recruiting models to generate a noticeable improvement in quality of recruits.
9. New dimensions of supply and demand will drive increased competition for the best faculty members and residents. Of particular note are a building boom of research space at top-tier institutions; the clinical capacities of our affiliated hospitals, outpatient sites, and physician practices; and relatively stable numbers of medical and graduate students and residents. While most competition for talent will be between institutions, some will be internal as a limited pool of institutional resources for recruiting must be spread across our entire enterprise.
10. An increased demand for medical and graduate students, combined with uncertainty about the future size of the applicant pools, will lead to increased competition for the best students. The size of the medical and graduate student applicant pools has been declining in recent years, although an upturn may occur, at least in medical school applications. Two new medical schools have been announced, and a third has been proposed, and the Council on Graduate Medical Education has proposed increasing the number of medical students nationwide by 15 percent. The research building boom in academic medicine will further fuel the demand for graduate students.
11. Traditional factors such as salary levels for faculty and financial aid packages for students will be eclipsed by nontraditional factors, such as support services, housing costs, spousal recruitment, intellectual quality of life, and leadership, in attracting and retaining talent.

12. Substantial barriers exist to the meaningful involvement of faculty in high-quality educational programs. These can be overcome with a combination of heightened focus on educational commitment during the promotion process, training and support for faculty members in their teaching role, and by continuing to modify reward and recognition systems.
13. In addition to the demands placed on medical education curricula by scientific and technological advances, we must expand our education programs to incorporate areas of ethics and professionalism, cultural diversity and social context, and use of information systems and other technologies to enhance patient care and safety.
14. Space is a limited, performing asset that must be carefully managed. Planning for the use of space is difficult—but necessary—as we use relatively fixed structures to accommodate increasingly dynamic programs. Space is among our largest costs, and efficiencies and increased productivity will directly advance the institution. Space belongs to the institution, not to component units, and its use must be constantly evaluated and adjusted to further institutional ends.
15. Like space, the deployment of information technology is a limited, enterprise-wide resource and a potential competitive advantage. How we use information technology—in physician and researcher tools, administrative and decision-support systems, and patient information and population-based research—will affect our performance and faculty recruitment and retention.
16. The pending closure of the Jesse Brown VA Medical Center's Lakeside facility strikes at all our core missions, which must not be allowed to suffer as a result.
17. Technology transfer is one of our largest untapped potential revenue sources, yet the school is currently not well positioned to take advantage of these opportunities. We must examine and remedy the contributing factors to this critical disconnect.
18. The strong trend towards internationalization should drive the school and its academic medical center partners to evaluate what it means—and what it takes—to be a global presence. Outstanding clinical care can draw international patients to U.S. medical centers. High-quality biomedical research is being done in other countries, and the regulatory and legal environments are more conducive overseas for some types of research (for example, stem cell and clinical trials). Disease epidemics do not respect national borders. Corporations and their workforces are increasingly international. Positioning an institution for success in the coming decades requires considering an international perspective.
19. Our collective and continued success is inextricably intertwined with that of our clinical affiliates. Achieving a shared vision of pre-eminence is beneficial to all the institutions in our academic medical center (University, school, hospitals, and physician practices). It will require the philosophical, cultural, and financial support of the medical school by all the clinical affiliates. All academic medical center partners must be attentive to each other's needs for maintaining a strong competitive and financial position.
20. Medical schools and academic medical centers that leverage their traditional missions to be mutually supportive and reinforce and productively deploy limited resources will thrive and prosper. Others will wither and die, abandoning one or more of their missions and/or constituencies.

## Sidebar Section

### National Directions in Medical Education

The AAMC Medical School Objective Project has identified key competencies medical students should possess upon graduation that will align medical education with evolving societal needs, practice patterns, and scientific developments. New curricular areas corresponding to these competencies are geriatrics, evidence-based medicine instruction, professionalism, complementary and alternative medicine, cultural competence, medical informatics, and computer-based instruction.

Similarly, the Institute of Medicine has identified critical areas in medical student education in the future and the skills and knowledge needed in clinical practice. These include the use of information technology to support clinical decision making and manage practices; working within teams and learning to improve efficiency and quality; communication and support skills to function as patients' partners, especially in managing chronic conditions; population-based care; and self-evaluation (reflective practice, lifelong learning, and accountability). Community service should be an integral part of educational experience, not an add-on; students and physicians should understand the social context of care.

### Diversity: Opportunity and Imperative

The 2000 U.S. Census diversity index (the likelihood that two randomly selected individuals are from different ethnicities) identified Cook County as the only high-diversity county between the Eastern and Western seaboard north of a line stretching from North Carolina to New Mexico.

### Our Research Direction

During the past five years, the Feinberg School's Research Council developed a framework for programmatic development that incorporates likely future research directions, the relative strengths and needs of our current enterprise, funding opportunities, the competitive environment, and the need to build momentum for recruiting. That framework identifies eight focus areas based on the current strengths of our enterprise and five cross-cutting general themes where major advances are most likely. These focus areas are bioengineering, cancer, cardiovascular disease, epidemiology and outcomes, genetic mechanisms of disease, immunology and transplantation, infectious disease, and neuroscience. The research themes are stem cell biology, genetics, signal transduction, functional imaging, and patient populations and health.

### An Opportunity in Translational Research

Obesity is increasingly recognized as a growing national health problem with social, environmental, behavioral, genetic, and clinical facets and implications. Making progress will require approaches fashioned from across a broad spectrum of disciplines. A cursory analysis of faculty interests and

resources at Northwestern reveals a wide range of expertise that could be brought to bear on the problems of obesity.

Faculty members working directly or in areas closely related to obesity are in the Feinberg School's Departments of Medicine and Preventive Medicine, in the Weinberg College of Arts and Sciences' Departments of Neurobiology and Physiology and Anthropology, and at Northwestern Memorial Hospital, Children's Memorial Hospital, and Evanston Northwestern Healthcare. Potential links may be made to the medical school psychiatry department, Weinberg psychology department, and Medill School of Journalism. Several major database projects exist, including NUGene, Women's Health Initiative, and CARDIA and MESA studies. The school has no competitors in the Midwest for obesity-related research or major clinical programs.

## A Sellers' Market for Research Talent

Three major trends will have a significant impact on the recruiting environment.

Growth of the NIH budget is flattening. After five years (1998–2003) of double-digit annual growth accomplished a doubling of the NIH budget, growth rates in the 2–3 percent range are expected for the near term. The creation of programs such as biodefense and the NIH Roadmap, coupled with commitments to ongoing multiyear grants, has tightened funding for traditional research.

Against the backdrop of the NIH doubling and a strong economy in the late 1990s, a building boom has taken place in academic medicine. The top 30 NIH-funded medical schools all have embarked on significant construction projects to expand research space. This has created a demand for investigators who can fill the space productively.

Funding for junior investigators has seen a significant decrease. The percentage of NIH awards to faculty under age 40 was halved from 35 percent in 1990 to 17 percent by 2001

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