Shaping the Future of Medicine: Excellence, Innovation, and Integration

Executive Planning Council Recommendations

July, 2012
These recommendations regarding the strategic priorities for Penn Medicine have been developed and submitted to Dr. Larry Jameson, Dean of the Perelman School of Medicine and EVP of the University of Pennsylvania Health System, and to Mr. Ralph Muller, Chief Executive Officer of the University of Pennsylvania Health System by the members of the Shaping the Future Executive Planning Council.

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I. Excellence, Innovation, and Integration

The last decade has been one of prosperity and notable advance for Penn Medicine. As we consider the next decade, powerful forces of health reform and global economic pressures threaten to destabilize the balance of our missions. At the same time, there is great potential for Penn Medicine to flourish during a period in which innovation and entrepreneurship will be rewarded -- from the unraveling of the basic mechanisms of disease, the application of these discoveries to develop new therapies, to new advances in population health management and, ultimately, advanced patient care.

Our recommended theme for Penn Medicine’s five-year strategic plan – *Shaping the Future of Medicine: Excellence, Innovation and Integration* – reflects our call to establish the most eminent faculty, to foster a culture of unbounded creativity, and to achieve greater alignment and integration of our structure and missions. Implementation of these recommendations will strengthen our sciences so as to advance understanding at the molecular and genomic level; create new capabilities to address the most complex of our patients’ diagnostic and clinical challenges across the continuum of care; enhance our impact on community and global health through prevention, screening, and population based intervention; and establish innovative modes of training which prepare physicians and scientists for the next generation of discovery and service. To accomplish these goals, the Executive Planning Council recommends the following priorities be placed at the center of our five-year strategic plan:

- Lead in the science and practice of **Individualized Medicine**, placing an even greater emphasis on service excellence and the patient experience; innovating in the development and evaluation of personalized diagnostics; and integrating multidisciplinary complex clinical care services around the patient supported by an integrated electronic medical record resulting in improved coordination of care.
- Establish a nationally recognized program in **Biomedical Informatics** that incorporates computational biology, bio-informatics, clinical informatics, population health informatics, bio sample management, and large-scale clinical data warehouses and information access.
- Commit to creative collaboration and improved relationships with industry that promotes the translation of our discoveries into effective new therapies, devices, and products. Establish a **Penn Medicine Innovation Center** to coalesce and focus the necessary resources into an “innovation zone” that ensures our discoveries are impactful.
- Invest in academic excellence through **focused recruitment and retention of outstanding faculty**, pooling our resources to create a balanced portfolio of present and future international leaders across disciplines.
- Launch recommended programs to reinforce our **commitment to a diverse and flexible workforce**, which promotes diversity, work-life balance and career flexibility for the faculty and staff.
- Convene a **Penn Medicine education council** to design innovative educational programs that span undergraduate and graduate education to prepare the health care and research workforce to meet and excel in the current rapidly changing environment.
Optimize the Penn Medicine ecosystem and establish integrated and transparent evidence-based finance and space allocation decision-making processes to ensure rapid implementation of these recommendations and future strategic initiatives.

Our commitment and investment in this strategic plan will establish the basis for the future prosperity and sustainability of Penn Medicine. The benefits to be gained are great. Our patients will benefit from advanced diagnostics and treatments delivered through a program of individualized medicine and a culture of service excellence. Our clinical system will work in collaboration with payers in new models of reimbursement such as bundled and value-based payment. Our outstanding scientists will be positioned to lead new discoveries and to garner enhanced support for this work through both public and private funding sources. Via new partnerships with industry, we will rapidly move the innovations of our scientists and clinicians to global markets and populations in need. Our campus will become an ever more preferred regional and national destination, evincing state-of-the-art clinical facilities and laboratories where burgeoning knowledge becomes the inception for emerging biotechnology companies. Nurturing physicians and scientists to work both individually and in teams across traditional boundaries is essential to these goals. Physician-scientists, one important catalyst in the translation of science into practice, provide an example of how to support and encourage the linkage of investigation with clinical practice and impactful implementation. Investment in state-of-the-art informatics platforms will enable researchers to make advances by harnessing the vast data available from our integrated enterprise to make more accurate and informed discoveries and decisions. To prospective faculty and students, we will be known as the institution with the most flexible and collaborative culture, where a free interchange of ideas and initiatives within and among missions is encouraged, supported, and celebrated.

To be successful, the entire enterprise must be committed to implementation of this plan. We encourage a renewed commitment to timely and bold decision-making coupled with efforts to streamline and remove administrative barriers to action that can prevent nimble responses to a changing environment.
II. Planning Process

These recommendations are the result of a faculty-led strategic planning initiative convened during December 2011 and co-chaired by Dr. Jonathan Epstein, Chair of Cell and Developmental Biology, and Dr. Deborah Driscoll, Chair of Obstetrics and Gynecology.

Six integrative working groups chaired by faculty leaders met for four months to consider Penn Medicine wide transformational initiatives and have provided comprehensive reports of their findings and recommendations, including over 250 specific strategic and tactical ideas. To support their discussions, fourteen focus groups were held with patients (including faculty), nurses, ancillary clinical services, medical students, residents, PhD students, postdoctoral fellows, basic sciences administrators, and researchers. Input on Penn Medicine’s strategy was sought from department chairs, institute and center directors, administration, staff and educational leaders. The Executive Planning Council (EPC), consisting of the Planning co-Chairs, the Chairs of each Work Group, and a representative each of the Basic Science and Clinical Departments, Center and Institute Directors, and administration, reviewed the Work Group reports, which are included as integral to this report, and the input received from throughout our community, and has formulated its recommendations to Dr. J. Larry Jameson, Dean and Executive Vice President, and Mr. Ralph Muller, Health System Chief Executive Officer.
III. Executive Planning Council Recommendations

1. **Lead in Individualized Medicine**

The future clinical environment will be characterized by rapid and precise individualized diagnosis and treatment, and comprehensive longitudinal care. In the near term we must prepare to excel in a healthcare environment in which reimbursement is likely to emphasize a single payment for an episode of care (otherwise known as “bundled payment”), whether it be straightforward or complex. Whereas many organizations are seeking to expand their scale of services, Penn will focus on using its resources for closer integration of existing assets and capabilities, controlling costs, emphasizing innovation, and selectively upgrading and enhancing facilities and programs. Better integration of our clinical operation with our academic research enterprise will give us a competitive advantage in the marketplace of academic medical centers.

Complex medical/surgical care is a strength and priority for Penn Medicine because it is where the integration of research, diagnostics, and therapeutics has the greatest impact on people’s lives. High complexity quaternary care services often bring patients to their first encounter at Penn via referrals to disease-based specialties. The most complex cases currently generate over 50% of the inpatient contribution margin and in our market are those most resistant to pricing pressure and provider competition.

Penn Medicine’s clinical enterprise has made significant progress in the areas of mortality and health care acquired infections since the inception of the Blueprint for Quality in 2007. For example, risk adjusted mortality has decreased by 45% over the past five years across the health system and central line catheter blood stream infections have decreased by 95% over a similar time period. Unit based clinical leadership teams are now fully operational in all Penn Medicine inpatient units. Despite these advances and our surfet of medical talent and high tech equipment, focus groups and interviews reveal that we are lacking in the kind of service, communication, and humanistic approaches necessary for an excellent patient experience – an assertion reinforced by the relatively mediocre performance of Penn Medicine hospitals in national patient satisfaction benchmarks.

The strategic goal is to achieve world-class service excellence in a patient-centered environment. Investments needed to achieve this goal will include advances in technology, electronic medical records, reporting, quality and cost measurement, and appealing clinical facilities with private rooms and state of the art design. Order of magnitude gains in quality, service, and cost will be achieved through collaborative re-engineering of clinical processes and enhanced service training with an emphasis on staff and physicians working together to deliver an optimal patient experience. We recommend that the entire Penn clinical delivery system be re-oriented and re-engineered to deliver uniquely excellent individualized medicine.
This approach will require the following initiatives:

- Place primary emphasis on exceptional care and service resulting in optimal outcomes and encounters that address the physical, emotional, spiritual and educational needs of the patient and their family with respect and courtesy.
- Implement wholly integrated electronic medical record and advanced information systems capabilities for clinical decision-making, genomic and biological marker testing, and seamless sharing of clinical information for both research and practice supported by a medical informatics program at Penn Medicine.
- Expand current successful integrated complex care programs and build new ones (e.g. neuroscience, GI, musculoskeletal) and develop innovative infrastructure and incentive programs for quaternary inter-disciplinary disease-focused team-based programs.
- Coordinate care across the continuum for each patient, including designating a clinical care coordinator, and creating interdisciplinary forums that collaboratively evaluate and discuss the care of complex cases.
- Launch innovative research programs to develop and evaluate novel clinical decision support tools and predictive models. Conduct health services and comparative effectiveness research to evaluate health outcomes of individualized medicine interventions.
- Strengthen our commitment to exploring the genomic and environmental factors that underlie variability in drug response so that we can progressively individualize our therapeutic choices and provide a uniquely tailored regimen to our patients.
- Upgrade facilities as necessary to realize our vision of service excellence, including planned projects to expand ambulatory capacity and upgrade to private rooms at Pennsylvania Hospital, relocation of HUP trauma to Penn Presbyterian Medical Center, and state-of-the-art replacement capacity for the Hospital of the University of Pennsylvania.

Achievement of these objectives will require commitment to an enhanced model of clinical services that we must all share in creating. It will require integration and coordination amongst facilities, CPUP, administrative leaders, CCA, CHOP, the VA, and referring physicians; unifying the electronic medical record and interoperability amongst sites and clinical affiliates; research led innovation in new models of delivery of health care; closer integration with industry; and campus upgrades at all our sites to provide the necessary settings for delivering this vision. The planned facilities projects include private rooms and expanded ambulatory capacity at Pennsylvania Hospital, relocation of trauma to Presbyterian Hospital, and state-of-the-art replacement capacity for HUP – all necessary contributors to a highly service oriented and efficient clinical delivery system.

2. **Realize our potential for innovation**

Excellence in complex clinical care and high impact fundamental research will be foundational requirements for our success in the future. Innovation in these areas will increasingly emerge at the intersection of disciplines and from faculty who integrate knowledge providing a milieu that will attract the world’s brightest faculty and trainees. Despite Penn’s highly collaborative culture, there remain significant opportunities for improved capabilities, programs, and infrastructure that will stimulate inter-disciplinary innovation. For example, Penn
Medicine must achieve the critical mass of faculty and information systems resources necessary to optimally integrate and draw insight from human genomic, proteomic, metabolomic and other functional data with clinical information. Furthermore, an assessment of our current state of research impact — such as faculty memberships in distinguished societies, citations in scholarly journals, and an ability to attract the very best investigators to Penn — all signify that opportunities exist for strengthening Penn Medicine’s research excellence.

Nurturing physicians and scientists to work both individually and in teams across traditional boundaries is essential to achieve our goals. However, despite our nationally eminent MD-PhD program, our pipeline of physician-scientists is in jeopardy. This issue is particularly striking in the Department of Medicine: in 2000 there were 35 tenure track physician-scientists under the age of 45 actively engaged in laboratory bench research; in 2012, there are only 3. While reflecting national trends, the pathway to independence for such joint trainees is currently hampered by the length of time for training, the redundancy embedded in training programs, and the lack of both viable and visible career structures. It is both timely and critical that we both build new and integrate existing training programs for MDs, PhDs and MD/PhDs which foster innovative thinking, and provide adequate resources and mentoring for success.

Our efforts to realize this potential for innovation must be supported by an elevated commitment to excellence — we must perform at the highest levels in all we do from recruitment, through promotion and retention of transformative individuals. We must increase our commitment to high-risk, high-impact research, and we must remove impediments to the realization of high-impact discoveries. Penn’s innovations, if wisely cast, will couple basic science discovery to accelerated translation in the form of new diagnostics and therapy. Our community can be optimally organized to be a true center for innovation. The following recommendations support the goal of accelerating innovation at Penn:

- Implement a novel, cross-disciplinary process to identify and streamline the recruitment of transformative individuals for primary academic pursuits, balanced by more focused traditional hires also aligned with the strategic plan. Over the next five years, recruit five highly accomplished investigators (e.g. National Academy members or equivalent) whose arrival will catalyze Penn Medicine’s scientific aspirations. These transformational individuals should be collaborative in nature and capable of enhancing recruitment and retention of other outstanding investigators, clinicians and trainees. Grow, empower and invest in the pipeline of scientists and physicians who bridge our basic and clinical missions.

- Create a comprehensive program to train, recruit, and support a stronger and more cohesive community of MD and PhD trainees with exposure to and expertise in the parallel disciplines of science and medicine. Nurture the continued career progression of MD/PhD trainees from completion of their graduate/medical training, through post-doc/fellowship and into the junior faculty ranks – stressing early progression to career independence. Provide clinical investigators with the resources, support, and time to be the leaders of their scholarly fields of expertise.

- Align administrative and faculty cultures with excellence by doing more to reward research success, enhance performance evaluation at all levels, offer competitive grants for high-risk high-impact research, and ensure that resources are aligned with the highest impact research. Support for faculty should be considered investments and
success should be valued as a substantial measurable return for Penn Medicine and the University.

Implement and invest in a unified initiative that spans the academic domain of biomedical informatics and information technology to create a class-leading link between science and medicine. This initiative should encompass all relevant fields such as: computational biology, bioinformatics, genomics, biostatistics, epidemiology, imagine analysis, and health and medical informatics. Moving swiftly in this area is imperative and should not await the eventual and necessary recruitment of an academic leader of a center, institute or department.

Support and augment ongoing plans for the Penn Biobank, incorporating a combination of patient specimen, clinical phenotyping, community and insurance-level data, along with the bioinformatics and infrastructure necessary for Penn to be at the vanguard of individualized medicine. Penn’s program will establish self-sustaining links to industry and far-reaching products across all disciplines. The creation of this platform can be staged incrementally with specific initiatives such as cancer, neurodegeneration and cardiovascular/metabolism so as to build deep and productive biobanks and datasets that can serve as foundations for broader implementation in the future.

Markedly increase investments in technology cores with exceptional faculty leaders paired to technical directors to establish and direct relevant core facilities. Optimize core functions and efficiency by centralizing core administration and financing.

Create a Penn Innovation Center that acts as an accelerator for transformational discoveries, assimilates existing administrative units relating to technology transfer and commercial collaborations, is responsive and accountable to Penn Medicine, and spans basic science and biomedicine as well as mobile health technologies, social media, comparative effectiveness, and health insurance benefit design. Establish a Penn Venture Fund as an investment vehicle for early stage Penn commercial activities that is managed at “arm’s length” to the institution and is capable of generating a positive return on investment within five years.

Capitalize on synergies that result from collaboration and, where appropriate, integration with our local partners. Penn Medicine possesses enormous opportunities, compared with many peer institutions because of our adjacencies to outstanding Penn schools and local institutions. Build on the success of the CTSA and other ongoing joint activities with Children’s Hospital of Philadelphia. Expand the scope and membership of the Penn-CHOP coordinating team to develop joint initiatives. Numerous other exciting and novel opportunities exist through partnership with Penn Engineering, Nursing, Dental, Veterinary, Wharton and Arts and Sciences.

3. **Enrich the life of our faculty with diversity and flexibility**

The PSOM faculty is among the very best in the world – whether measured by tangible accomplishments such as awards, publication impact, clinical productivity or grant funding, or by more intangible, often more enduring achievements, such as collegiality, mentorship and commitment to excellence. Surveys of our faculty uniformly indicate that the climate, culture and collegiality, collaboration, mentoring and feedback are among the foremost positive characteristics of life at Penn. Despite these great strengths, there are significant opportunities to further enhance faculty life at Penn. Today, only 5% of Perelman School of Medicine faculty members represent underrepresented minority groups and only 33% are women. Achieving the
goal of a diverse faculty that mirrors our American, if not world, society will foster a culture of inclusion that will in turn advance innovative research, enhance education, and deliver healthcare to increasingly diverse local and global communities. Faculty members truly value the intellectual vitality of the Penn Medicine workplace but report that time pressures and maintaining the balance between their professional and personal lives are of increasing concern.

The PSOM currently has four full time faculty tracks: Academic Clinician, Tenure, Clinician Educator, and Research. Although current policies provide some flexibility, this flexibility may not be clearly understood. There is relatively little movement between tracks and a perception amongst faculty that the track system is rigid and unable to be responsive to change in faculty interest or career evolution. An opportunity to evaluate the tracks and embrace changes in the career trajectory of an individual for both faculty and institutional success exists.

The following initiatives are critical to enriching faculty life at Penn:

- Recruit a Vice Dean for Diversity and Multi-Cultural Affairs to lead an Office of Diversity and Multi-Cultural Affairs. Empower this position and office to have meaningful impact on recruitment, retention and cultural balance.
- Enhance the flexibility of faculty tracks by: re-evaluating the requirement of a national search during a track change; renaming the Clinician-Educator track to Clinician Scholar; enhancing equity between tracks by balancing compensation, security, flexibility, and benefits; highlighting to faculty, COAP, and Chairs the range of successful career pathways for Clinician Scholars; further developing the Academic Clinician track to maximize equity in benefits and status to recognize the importance of these faculty to our overall success; extending the length of time for outstanding young faculty to reach their potential.
- Develop metrics for collaboration, mentorship, community engagement and professionalism to be incorporated into faculty evaluations, including promotion and compensation decisions.
- Implement an equitable, mission based school-wide faculty compensation strategy that uses consistently applied, universal principles to set and adjust salaries and incentives.
- Designate leaders to oversee mentoring and professional development of faculty within each department (and larger divisions).
- Improve and expand on-site day care services with expanded operating hours to accommodate the lifestyle of Penn families.
- Create shared spaces for faculty to foster innovation and collaboration, and enhance faculty productivity, creativity and satisfaction.

Encouraging and supporting the recruitment and retention of a diverse faculty, creating flexibility and embracing changes in career trajectory will foster an environment in which each individual can reach their potential.
4. **Impact health outcomes locally and globally**

As responsible physicians, providers and scientists at Penn Medicine we have a moral and ethical responsibility to share our knowledge and expertise to significantly improve the health outcomes of our surrounding community, the nation and under-served areas in the world. Towards that end, building multi-disciplinary partnerships locally and abroad will transform our educational endeavors and create new and better ways to provide health care. Several of Penn Medicine’s top-ranking peers lie in Universities that have a School of Public Health, and in that setting these schools both garner resources and take the lead in the coordination of community engagement and global health initiatives. Absent this, Penn has strong examples of successful initiatives both locally and globally that are limited to circumscribed efforts, rather than institutionally coordinated.

The Philadelphia region has areas of significant health need. Dialogue with the community that is institutionally coordinated and strategically aimed at matching Penn’s clinical strengths, community-based research and educational ambitions with local needs can have a positive long term impact on the lives of those whose neighborhood we share. Engagement with our community enables Penn to refine and optimize its methods for reducing health care costs and promoting wellness. Addressing high cost illnesses associated with deficits in diet, nutrition and exercise, or high-risk behaviors such as smoking, substance abuse, or unprotected sex, better prepare us for a reimbursement environment designed to improve healthcare value. The steps below will lead to a sustainable symbiotic relationship where Penn’s missions are enhanced and the community health status is improved.

- Create a community board through which Penn Medicine and the community engage in open dialogue, develop trust, and share responsibility for identifying new opportunities for education, clinical services, and research that provide mutual benefits to the institution and the community.

- Coordinate Penn Medicine’s community efforts so as to enhance access to care, increase patient satisfaction, enhance student mentoring, and increase the numbers of research studies devoted to problems that disproportionately affect underserved populations. Coordination should extend to the Provost Office and the Center for Public Health Initiatives, across other schools, such as the School of Nursing, and with external partners, such as Veteran’s Affairs and CHOP.

- Encourage community-based engagement and research through funding pilot projects, and reward and recognition in the promotion process.

As part of its mission as a leading international institution, Penn Medicine should make additional efforts to improve human welfare in under-resourced areas of the world, consistent with the University’s newly announced strategic plan for global initiatives, which is based on three pillars: to prepare students and trainees for an increasingly globalized society; to strengthen Penn as a global agenda setter; and to improve the world through enhancing health in under-resourced areas of the world. The present global health program at Penn Medicine is a strong, though limited, initiative that lacks the breadth and depth of the “major league” programs of our peers, particularly those with Public Health schools. A robust global health
A New Era of Innovation

program will serve many purposes: it will enhance Penn Medicine’s recognition both at home and abroad; it will provide international sites for education and training of US and other health professionals; and it will offer opportunities for service and research sought by our faculty. Four initiatives will establish the basis of Penn Medicine’s future strength in global health:

- Consolidate existing and new efforts of education, research and implementation for Penn Medicine’s global agenda under a single Center or expanded Office of Global Health Programs, working in collaboration with the university. Strongly consider recruitment of a new leader for this unified entity.

- Establish a centrally coordinated program within this Center built around the theme of implementation science, defined by the NIH as “the study of methods to promote the integration of research findings and evidence into healthcare policy and practice”. Evidence-based implementation can leverage biomedical research, engineering, psychology, sociology, economics, and education to produce improved outcomes that take into consideration the uniqueness of each environment and how best to deploy proven treatments and therapies. Penn’s unified campus and highly collaborative faculty make implementation science a distinctive platform for engaging globally as well as locally.

- Strategically launch 1-2 new global sites of engagement in different continents (for instance, one site in an African country and another in Latin America) modeled on the university-to-university relationship as exemplified by the Botswana-UPenn Partnership.

- Pursue, opportunistically, “Penn Global Health Consulting” as a revenue-producing venture offering up Penn’s considerable expertise to governments and partner institutions as needed to address critical health needs.

In concert with our mission to train global leaders, advance the foundations of global health education to our MD, PhD and resident/fellow trainees. Lead in the education of Penn medical students by fostering expansion of global health courses and programs both within the PSOM and the MPH program.

5. **Create innovative interdisciplinary educational programs**

A primary mission for Penn Medicine is to develop and mentor outstanding individuals committed to careers as leaders in medicine and research. The physical integration of the University of Pennsylvania’s schools on a single campus provides unique opportunities to develop integrated educational programs within Penn Medicine and with programs in other schools in the University.

The Perelman School of Medicine’s last major reform in undergraduate medical education (UME) took place in the late 1990’s, and was innovative and highly successful. The UME program has emphasized small group and team based approaches and has been enhanced by participation from students in other health science disciplines, engineering, and the robust MSTP program. Coupled with the strength of the integrated Biomedical Graduate Studies (BGS) program, which has undergone serial revision over the past 23 years, and the increasingly rich array of master’s programs, the Perelman School of Medicine’s educational environment has been widely recognized as among the very best in the country.

We are at an important inflection point given the continued evolution of the practice of medicine and the conduct of science, combined with powerful internal and external forces that challenge the viability of academic medical centers. Accordingly, ongoing innovation in the
structured approaches to the development of future leaders in medicine and research is essential. Furthermore, there will be strong internal forces (within Penn Medicine, e.g., away from silos and into team-based care and research), and external forces (outside Penn Medicine, e.g., NIH or GME reductions in funding for both research and training) that will require us to rethink and redesign new models for teaching and training future physicians and scientists that emphasize team training, collaboration, interdisciplinary and inter professional activities, online access, and the reduction of the costs and time to train. As noted above, the cross-training of physicians and scientists is both critical to this endeavor and a potential strength of Penn Medicine.

It will become increasingly necessary in this dynamic time of change for Penn Medicine to enhance the coordination across our educational offerings (UME, GME, MSTP, BGS, Masters, Postdoctoral, and CME) so as to pioneer emergent paradigms of instructional models and programs supported by new funding models and/or sources, that facilitate the ability of our students and trainees to have impactful careers in their respective fields.

As an initial action, a Penn Medicine Education Council (PMEC) of senior leaders should be convened to review our existing educational framework, to develop recommendations for the design and implementation of required refinements, enhancements and changes to our current systems and approaches that address the recommendations brought forward by the individual Strategic Plan Work Groups. This process must incorporate national and global changes in undergraduate and graduate medical and research education, and the potential for substantial cuts in funding for education and training via traditional mechanisms.

The PMEC should enlist the active participation of clinical and basic science faculty, department chairs, center and institute directors, and administration leaders, in addition to appropriate external advisors, such as development staff and consultants in order to promote innovation and to incorporate new modes of education into the changing Penn Medicine landscape. A broad reassessment of our educational mission is timely, as it will help to inform the plans for a new or renovated medical education building. It is expected that the PMEC would complete this initial planning stage within a six-month time frame.
III. Implementation Recommendations

6. Optimize the Penn Medicine Ecosystem

The Penn Medicine financial and market position is strong and provides a solid platform from which to invest in our strategic imperatives. A favorable clinical care reimbursement rate environment over the last decade combined with consistent reductions in costs, aligned with a high level of success in garnering competitive NIH and ARRA funds, have provided the basis for investment and research support across the enterprise. However, the “macro-economy” of Penn Medicine will become increasingly vulnerable to the shocks induced by health reform and federal deficit management. Penn Medicine relies on its high commercial payer margins as an important means of support for its academic programs and medical educational endeavors, with a significant percent of the clinical margin going to this purpose. However, capacity limits at HUP, anticipated reductions in reimbursement, and changes towards value-based payment will reduce the clinical margin and place broad financial pressure on our entire enterprise. The forecast reduction in margin is paralleled by potential decreases in NIH funding and the end of ARRA funding, which will exacerbate the fiscal pressures on our organization at the very time we strive to invest in important new initiatives. Recommendations for optimizing the Penn Medicine ecosystem – and generating new resources include:

- Establish integrated and transparent evidence-based finance and space allocation decision-making processes across Penn Medicine. Replace the Academic Development Fund (ADF) and EVP Dean’s fund with a new funding mechanism which distinguishes new initiative investment from on-going support, and which rewards peer-reviewed merit and collaboration. Charge the basic science chairs and Institute/Center directors to recommend an objective and transparent funding methodology to support the academic missions. The new funding mechanisms should incorporate the need to provide medium-range stability to Institutes/Centers for administrative support and ongoing expenses while retaining flexibility for investing in other academic initiatives.

- Require each department to have a Space Plan and perform annual assessments of productivity and dollars per nsf to ensure that decisions are fair and balanced.

- Implement the Space Assignment Decision-Making processes recommended by the Committee on Resources and Support of Faculty (2006), which provide clear guidelines for when space should be reduced for a principal investigator or program.

- Conduct formal reviews of Centers and Institutes and their directors with resource allotments and reappointments based upon well articulated metrics of success, including general quality and mission specific criteria to optimize the resources invested in these inter-disciplinary organizations.

- Clarify faculty compensation policies including definition of academic base, fixed and variable compensation components, incentive metrics and use of administrative stipends for salary support where appropriate. Establish defined expectations of effort allocation and service for each faculty track. Specify salary coverage expectations from the respective sources, and establish a “salary support first” policy that requires faculty members to utilize their restricted and designated funds, and/or gift/endowment funds, toward salary gaps. Enact these policies in a consistent manner within faculty tracks and across departments and incorporate terms in all faculty offer letters.
Reorganize administrative services amongst PSOM entities, between the University and PSOM, and improve consistency of services to enhance productivity. Establish clear performance metrics to improve accountability and performance. Eliminate Penn Medicine internal incentives that encourage duplication of administrative infrastructure.

Improve efficiency of clinical operations through integration of management engineering within units and promote integration across HUP, PPMC, and PAH to optimize capacity.

7. **Deliver results through leadership and collaboration**

Supporting our strategic investments will require a sustained, Penn Medicine-wide commitment to operating efficiency, resource re-allocation, funds flow management, maintaining clinical margins, maximizing returns from investments in research, and enhancing philanthropy. All parts of our organization will need to pull together to accomplish these aspirations. Perhaps most importantly, this will require an enhanced degree of transparency and trust amongst the Chairs, Center & Institute Directors, and administration.

Chairs/Directors will need to work closely together to manage resources so as to invest in the strategic priorities; for instance, committing replacement recruitment to informatics and new program areas; agreeing on incentives and a collaborative process to fund the recruitment of transformative individuals, and committing to the implementation of compensation policies and performance-based metrics that can allow resources to be reoriented to new initiatives and reward high performing areas. Similarly, the recruitment of new Chairs/Directors in the future must incorporate in the commitments made to them (where appropriate) support for the strategic priorities. Alignment of services around the patient in interdisciplinary services should incorporate modifications to funds flow that include all the stakeholder disciplines that are in a position to influence the success of the program.

Chairs must also be empowered with the principal responsibility for executing the salary arrangements for their existing faculty and for any new faculty. Effective salary policy is weakened if chairs do not have clear institutional guidance about standards and rules, and authoritative sources of advice when there are questions.

The Chairs/Directors will also need to work hand in glove with the administration to continue to reduce administrative costs, stage the implementation of new clinical facilities and programs that generate enhanced clinical results, and optimize the use of shared resources such as space, information technology, and human resources. An assertive program to reduce duplication and streamline operating costs will need to be undertaken in conjunction with the University, calling on external expertise as necessary to comprehensively review and recommend improvements to improve service while reducing duplication and costs.

Working together in new ways must also extend to the administrative services of Penn Medicine. Over the course of the last several years our organization has increasingly become more unified in areas such as information technology management, marketing and development, and facilities management. We recommend that this trend continue, with particular emphasis on coordination in finance and the process for capital allocation, space administration, and human resource management. At the same time, administrative burdens that diminish faculty productivity must be minimized with attention to reducing unfunded mandates and the time necessary to meet ever-increasing compliance and conflict-of-interest imperatives.
IV. Comments from Chairs and Centers/Institute Directors

Clinical Chairs

The strategic planning process and resultant recommendations are based on a series of themes or concepts that encompass some 35 initiatives, designed to make Penn Medicine the premiere academic medical center in the country and to prepare us for the evolution of healthcare delivery in the near term.

A. Clinical Themes

The clinical mission is the major financial driving force for the AMC.

Theme 1: Improvement

High performance in our clinical mission requires delivering to our patients what they want and need unambiguously, on time, in the proper amount, without waste, defect or error. Presently, our level of service and our clinical outcomes are average and not consistent with the distinction and respect with which Penn Medicine is held in the community. In order to achieve this aspiration of high performance in our clinical mission, we must engage in continuous improvement through continuous learning how to deliver care in a flawless fashion. Each clinical service must be evaluated as to whether we have the proper level of expertise, whether we provide the proper level of staffing to deliver consistently excellent service to our patients, and compared against rigorous measures of clinical outcome within our peer group. In order to achieve service excellence and exceptional clinical outcomes, resources (increased staffing, decision making tools, and systems engineers) will need to be embedded at the point of care to assist clinicians in the delivery of complex care. This will require significant redesign in the current delivery system but will come at a time when reform in care delivery will be the norm in American medicine. We have a chance to lead in this domain. There is a price to service excellence and the achievement of clinical outcomes. The clinical chairs believe that the proper investment in service will have a multiple rate of return in financial performance. The failure to do so may result in losing ground with respect to the reputation of our clinical excellence.

Theme 2: Integration

Given the complexity of clinical care that is the essence of our clinical mission, we must develop integrated systems of care delivery. This will require operating outside the traditional department silos and can be achieved through the development of integrated clinical service lines. Several examples of the service line approach exist within Penn Medicine, but the strategic plan calls for advancing these concepts to the disciplines of musculoskeletal disease, metabolic diseases, neurological diseases, and women’s health to name a few examples. The success of this approach will require moving away from individual and department based incentives to programmatic incentives. The change in incentives is in keeping with the concept of bundled payments, emerging as a cornerstone of reimbursement reform. The integration of clinical services across disciplines requires an integrated information system. Currently, the clinical delivery system operates in 5 distinct platforms with little integrated functionality. The clinical chairs endorse strongly the concept of a single clinical information platform. If not, then existing platforms must have functional interfaces that allow for the seamless exchange of information. Ideally, the current 5 platforms should be reduced to no more than two.

Theme 3: Individualized Medicine

The clinical chairs strongly endorse the development of individualized medical approaches to care. This requires the development of bio-banking capabilities, genomics, and clinical informatics together with uniform, detailed clinical phenotyping. The bio-banking initiative is a unique opportunity to once again,
bring together the world of basic biomedical discovery with clinical care. The initiative provides an opportunity to redefine the role of CE track faculty within Penn Medicine. The clinical chairs suggest that these individualized platforms be advanced within a few well defined disease-based disciplines and piloted to better understand the required capabilities and the barriers to broader implementation.

**Theme 4: Internally focused**

The strategic plan states emphatically that Penn Medicine will remain internally focused and not develop community and regional affiliations with other healthcare systems in anticipation of health care reform. Nor will Penn Medicine expand its primary care base or experiment with alternative delivery system models of ACOs, at least in the near term. Rather, Penn Medicine will look to individual opportunities with groups of physicians and focus on **reinvestment in its human capital and physical plant**. Penn medicine will continue to focus on advanced medicine which should remain immune from pressures of declining reimbursement, recognizing that 10-20% of our activity (advanced medicine) accounts for 50-70% of our margin.

The clinical chairs remain divided on the wisdom of this approach, but agree that it seems reasonable in the near term (1-3 years). However, the clinical chairs strongly urge exploration into the implications of different payment and delivery system models such as ACOs, bundled and tiered payments.

Demonstration projects should be commissioned within CPUP to model these possibilities.

**The acknowledgement of the need for commensurate reinvestment in both human capital and infrastructure is endorsed by the clinical chairs.** The strategic planning document is unambiguous in linking inextricably these two priorities, acknowledging that while new clinical infrastructure is necessary for financial stability, it is insufficient absent a commensurate reinvestment in human capital.

While focused internally, we must recognize our moral obligation to the West Philadelphia community. The clinical chairs endorse the concept of a UPHS wide effort to improve the health and wellbeing of our neighbors.

**B. Research Themes**

Our research mission is what distinguishes our health system from other regional competition and is the **distinctive feature** of Penn Medicine that gives rise to its ranking among the top 3 AMC in the US. The clinical departments account for two-thirds of the research activity of Penn Medicine. Thus, clinical excellence is inextricably linked to research excellence.

**Theme 1: Innovation**

The clinical chairs believe that biomedical discovery should be focused on the betterment of the human condition. As such, each research program within Penn Medicine should be examined and redefined as to the human condition being addressed. Broadening the definition of what defines research excellence to include the betterment of the human condition will require investigators to rise above the narrow confines of their individual laboratories and personal successes and embrace the unique opportunities to share and collaborate toward the modification and eradication of human disease. This approach lends to the further development of translational research programs currently focused on T1 discovery. Thus, research productivity should be measured not only in terms of publication impact and grant funding, but also with respect to the engagement of the translational research community and marked against progress toward new drugs, therapeutics and devices. Creating an entrepreneurial culture will require reaching across disciplines and schools and will require fundamental reform within the structures with the SOM and University (OHR,ORS,CTT) transforming these entities from bureaucratic and regulatory bodies into service organizations. In this regard, the clinical chairs endorse the creation of the **Penn innovation Center** within the SOM and with close ties to the CTT structure within the University. The clinical chairs endorse the call for an external review of tech transfer across the University. Finally, the chairs endorse
the concept of the Penn Venture Fund to create equity partnerships focused on the development of the most promising biomedical discoveries and their “first in man” applications on the path to commercialization.

**Theme 2: Inspirational Research Leaders**

The clinical chairs endorse the recommendation to recruit outstanding basic researchers to Penn Medicine, mindful that these individuals should appreciate and respect the Penn culture of collaboration.

However, the clinical chairs feel strongly that this focus on transformative scientists should be part of a *portfolio of research investments*, as suggested by the Centers and Institute Directors. We suggest conducting an evaluation of our research talent to identify our best investigators. We recommend reinvestments in the most promising scientists and physician scientists in our midst who themselves demonstrate a penchant for excellence and are candidates for the National Academy of Sciences. There will also need to be reinvestments targeted to accommodate bridge funding needs as the uncertainty at the NIH persists. Finally, there is a widely recognized need to replenish the *pipeline of young physician scientists* who have served as the backbone of the scientific enterprise at Penn. Here, the efforts must extend for sustaining the MSTP program, to identifying dedicated GME funding for PSP candidates, to the Penn Scholars Program to recruit the best and brightest young physician scientists as faculty to Penn.

**Theme 3: Integration**

As with the clinical mission, so too in research we must develop better integration between members of our research community and across the spectrum of research from basic to translational to clinical and health services and health policy research. Such constructs do not conform to the departmental structures and thus there is a need for Centers and Institutes to develop these integrated scientific activities. The chairs endorse the concepts of these entities across UPHS, but believe that there should be a systematic review of these entities every 3 years to assure accountability for the use of precious resources. While the clinical chairs acknowledge that the decision making process should be streamlined, there is a clear call for the clinical chairs to be engaged and informed if not responsible for the recruitments within these disciplines. There should also be a transparent review of the 27 existing Centers and Institutes and consideration given to sun-setting those who have fulfilled their mission.

**C. Educational Council**

Given that the clinical department provide over 80% of the undergraduate and graduate education at PSOM, we strongly endorse the creation of a dedicated group to examine the opportunities and challenges within our educational mission.
The basic science chairs strongly believe that the recent absolute and relative prosperity of Penn Medicine, when compared to our peers, offers an unusual opportunity for advancing our institution - an opportunity that may not arise again for 25 or 50 years, if then. We applaud the investments that have been made in new buildings and in renovating our campus, but we feel strongly that investments in our most valued asset, our faculty, must balance investments in bricks and mortar. We should leverage our competitive advantage to recruit and retain the very best in order to optimize our chances of future prosperity and eminence.

1. We recommend that Computational Biology and Bioinformatics (CBBI) be clustered in a campus wide conceptual/intellectual center or Institute that includes programmatic, service and educational components. This center would have real and virtual (for example most tenure track faculty and many service providers will be dispersed amongst existing Departments, Centers and Institutes) components and would include PCBI, a Bioinformatics Core, the Graduate Group in Genomics and Computational Biology and the diverse individuals in the medical school and the health system providing service who would be organized under the leadership of Brian Wells. The attractions of this approach are that (i) it could be created swiftly under interim academic leadership and afford a single, integrated point of investment in this area by the PSOM, UPHS and the University; (ii) it would create a visible aggregation of resources to aid recruitment of a permanent academic leader; (iii) it would foster the nascent development of faculty with CBBI expertise across our existing DCI structures and (iv) it would lend itself to further development according to the desires and experience of a new permanent director. This Center could most logically be nested initially within an existing institute, given the immediate need for an administrative structure. The suitability of ITMAT has been proposed, given (i) its campus wide reach, (ii) its integration with CHOP, (iii) its commitment to catalyzing interdisciplinary program development, infrastructure and education. However, the goal is to use this center to enhance recruitment of a permanent academic leader and to establish an independent center, institute or department according to their wishes.

2. We recommend that there be a comprehensive and transparent review of CTT and the quality of its services. While we believe that CTT should be the central focus of such a review, consideration of how CTT fits within and catalyses the entire entrepreneurial ecosystem at Penn should be amongst the prime considerations. External experts should be intimately involved in this process, which would assess objectives, governance, metrics and incentives. In particular, this review should focus specifically on interactions with PSOM in comparison to similar interactions in institutions such as Stanford, MIT, and Harvard and its associated hospitals. We support the creation of a venture fund to support intramural research with entrepreneurial objectives, and the consideration of how new models of entrepreneurial activity might be developed at Penn as the drug discovery and development landscape undergoes such fundamental change. We further recommend regular meetings of a governance committee for CTT, with the committee being representative of the support for CTT provided by different schools at Penn.

3. We applaud the initiation of a comprehensive review of ULAR that has been initiated under the direction of Dr. Wilson and urge the inclusion of substantial extramural input into these deliberations as we have described in the review of CTT.
4. We recommend that the Basic Science Chairs will lead the recruitment of the high impact individuals envisaged by the corresponding working group, making strategic decisions in consultation with the Dean as to areas and individuals of focus. We believe that this initiative should be incorporated into existing (expanded) recruitment plans for the Departments, rather than being strategically independent. A School-wide strategic plan for faculty recruitment should be developed by the Basic Science Chairs together with the Dean, CSO, and consultative bodies.

5. We recommend that clear expectations concerning research, teaching and service activity be laid out to faculty in basic science departments so that their effort is accountable. We also recommend that Chairs be clearly empowered to reduce the salaries of underperforming faculty who consistently fail to meet agreed-upon criteria, and that this option be available at the Chairs’ discretion.

6. We do not support the constitution of a Department of Global Health.

7. We recommend continued enhancement of graduate education and its strong support by PSOM, particularly including the development of experiences that prepare graduates for nontraditional as well as traditional research based career development in academia or the pharmaceutical industry. We recommend that there be a formal review of the Governance (specifically, consideration of a Vice Dean), structure and resourcing of BGS and how faculty service to BGS might contribute to their effort distribution.

8. We recommend that the Basic Science Chairs meet regularly (e.g. monthly) with the Dean to review and initiate strategic considerations relevant to the academic mission of Penn Med. We believe that there has been considerable erosion of power from the basic science chairs over the past decade and that it is both appropriate and timely that we assume the responsibility as an Executive Committee that defines and implements key strategic goals for the academic mission. We also recommend that the Basic Science Chairs be engaged by leadership with the Development Office in philanthropic efforts and industry interactions devoted to strengthening basic science at Penn.

9. We support the development of a clear, transparent and rational basis for allocation of resources amongst basic science departments and continued investment to develop and sustain our cores on the cutting edge of technology development. In particular, we urge acceptance of the fact that cores offering technology crucial to PSOM’s success cannot be held to the old model of cost neutrality. Certain cores such as those offering services in Biobanking, Next Next Gen Sequencing, and computing infrastructure for bioinformatics, Proteomics, and Small Molecule screening will need regular investment by the School – to update instrumentation – if Penn is to remain competitive and retain faculty. A robust process for clearly defining strategies and priorities for investment in new technologies in these cores is essential.
Center & Institute Directors

The Center & Institute Directors endorse the EPC Recommendations and highlight the following:

OVERALL: Consensus of I/C Directors:

- I/Cs play a critical role and contribute uniquely to the fabric of Penn Medicine
- Penn’s extensive network of I/Cs distinguish us from our peer institutions.
- I/Cs facilitate development and maintenance of interdisciplinary science areas not well covered by individual departments at Penn Medicine and across the University.
- I/Cs harvest the value of the physically integrated campus on which we exist
- I/Cs catalyze translational research, providing a bridge from basic to clinical research
- I/Cs are nimbly receptive to novel NIH initiatives
- Strengths of I/Cs enhance external recognition in their mission-specific area

WORK GROUP-SPECIFIC: Key Issues Affecting I/Cs listed by WG:

Pathways to High Impact Discoveries:

- I/C Directors are ideally positioned to vet the need and potential use of new technologies
  
  With their breadth and depth of expertise, the Committee of I/C Directors should be a key evaluator of “Innovation Centers” performing basic research with an eye towards translation, or high risk research aimed at assuming leadership in new technology platforms

- I/Cs aid in recruiting the best new talent
- I/Cs catalyze cross-fertilization with regard to Penn Med departments and University Schools

Shape of Faculty Life:

- I/C participation should be considered by COAP
- Younger faculty benefit from official mentorship role from I/C(s) most closely related to their interests

Resourcing the Penn System:

CRITERIA FOR BEGINNING OR RENEWING I/Cs:

- Must be interdisciplinary area, not subsumed by a single department
- Must be an institutional priority for one of the following:
  - Key disease area with translational potential
  - Selected non-department-based new disciplines or technologies
  - Visionary leader in a non-department-based area
- For renewal: Must fulfill the following metrics of success:
  - Leverage of institutional funding as paid off by:
  - Interdisciplinary, collaborative research grants
  - Training grants
  - Yield on pilot grants
A New Era of Innovation

- High impact papers coauthored by multiple I/C members and/or using I/C-specific cores or resources
- Success in recruiting

Integration of Knowledge:
• I/Cs are the ideal means of integrating knowledge across disciplines, departments of the SOM, and schools of the university at Penn

Role of Penn Medicine in the World:
• In certain areas, I/Cs should take the lead in global initiatives

Pathways to Clinical Excellence:
• Leverage excellence in the areas of the I/Cs, and their membership including faculty from both clinical and basic departments, to translate research findings into new therapies
V. Work Group Members

The Executive Planning Council deeply appreciates the contributions of the following individuals:

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