

**Analysis and Recommendations for Research Governance Structure
on the Anschutz Medical Campus
“Bridging the Research Gap”**

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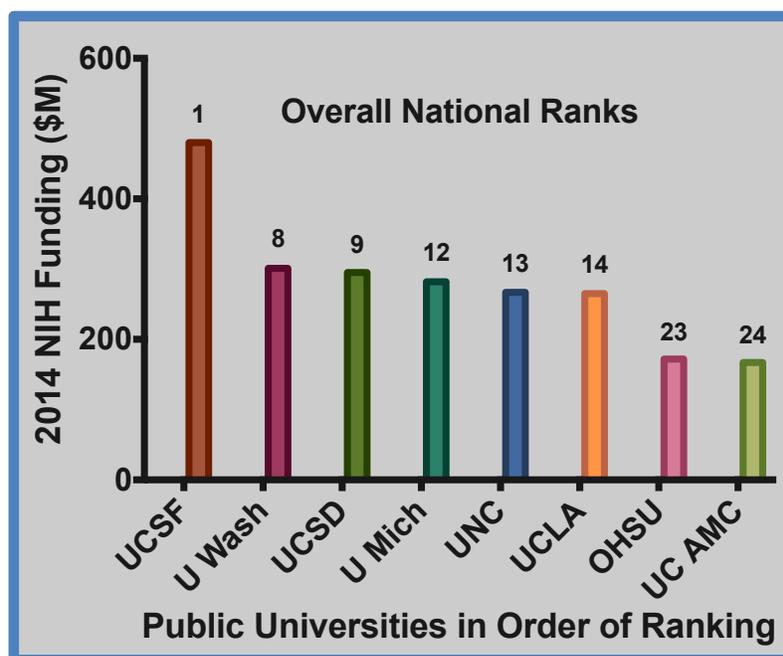
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Problem Statement

The organization of academic health centers (AHCs) is remarkably complex, as it spans units within the university, research, clinical practice and hospitals. This leads to a variety of services being offered at AHCs, including clinical care, undergraduate education, graduate medical education, biomedical and basic research.¹ The University of Colorado Anschutz Medical Campus exemplifies AHC complexity integrating the University of Colorado Hospital, the University of Colorado Health System and the various academic schools (Medicine, Nursing, Pharmacy, Public Health, Dental) while maintaining relationships with Children's Hospital of Colorado, Denver Health and the Denver Veteran's Affairs Medical Center.

Given the vast array of organizational structures within the institution, the question that was posed to us by Richard Krugman, Dean of the School of Medicine and Vice Chancellor for Health Affairs, was whether or not the current governance structure of the campus is optimal for sustained research excellence. The question of governance is compelling given the threats to AHCs, including potential changes in reimbursement for medical providers, the implementation of the Affordable Care Act, globalization of research and the tightening of pay lines for government-sponsored grants for basic research (e.g., NIH). Although there are many possible metrics for research excellence, the one our group gravitated to was the amount of external grant funding procured through the National Institutes of Health (NIH). University of Colorado Anschutz Medical Campus currently ranks 24th among public and private academic institutions and 8th among public institutions in terms of NIH funding. (Figure 1)

Figure 1. 2014 Rankings in National Institutes of Health (NIH) Funding Among Academic Medical Centers in the United States



We interviewed key stakeholders and reviewed literature relevant to governance structure in academic medical centers. Our key informants included:

- Liz Concordia, MD, CEO University of Colorado Health System
- Lilly Marks, Executive Vice Chancellor Anschutz Medical Center
- Jane Schumaker, Chief Financial Officer University Physicians Incorporated
- Richard Krugman, MD, VC Health Affairs, Dean Colorado University School of Medicine, Chief Executive Officer University Physicians Incorporated
- John Harney, University Colorado Hospital Chief Executive Officer
- Rod Nairn, PhD, Provost and Executive Vice Chancellor
- Jean Kutner, MD, Chief Medical Officer University of Colorado Hospital
- Mark Johnston, PhD, Chair Biochemistry and Molecular Genetics
- Don Elliman, Chancellor University of Colorado Anschutz Medical Center
- Richard Traystman, PhD, Vice Chancellor for Research
- Ron Sokol, MD, VC Clinical/Translational Research, Director Colorado Clinical Translational Sciences Institute
- Fred Suchy, MD, Chief Research Officer Children's Hospital Colorado

As described in Wietecha et al. (2009), the original governance model for many AHCs was a university-based model, but with the growth of commercial health insurance, Medicaid and Medicare during the 1950s and 1960s, this led to the realization at many places that the university structure would not be nimble enough to accommodate the clinical revenue structure. This is true as well for the University of Colorado, and in the 1990's, the University of Colorado Hospital and the School of Medicine separated as organizations.

Academic health centers have two general organizational models: 1) a fully integrated single leader– all academic, clinical and research functions report to one person and one board, and 2) a divided model in which academic and clinical functions are managed separately and report to different boards. In our meetings with key stakeholders, The University of Pittsburgh School of Medicine and University of Pittsburgh Medical Center, technically a divided model but with a high degree of integration atypical of most divided models, was provided as the exemplar of a strong-integrated organizational model with advancement of the research mission at its core.

University of Pittsburgh School of Medicine – centralized leadership

To understand the success of this model, the historical underpinnings of its creation are important to describe. This highly integrated model with a strong reliance on research was borne out of a failing psychiatric hospital. The psychiatric hospital was relying on Freudian psychoanalytic techniques in an era of increasing focus on pharmacologic approaches to management of psychiatric illness. A foundation provided substantial funding to transform the psychiatric hospital into a clinical research institute. Jeffrey A. Romoff and Dr. Thomas Detre worked as a team to rebuild the psychiatric hospital with a goal of creating a critical mass of scientists by offering top researchers jobs they could not refuse.² Their model sought to maximize efficiencies in clinical delivery systems to generate income that was then channeled into academic medicine to obtain research funding.

Dr. Detre was chairman of psychiatry and also the director of the hospital and thus had a seamless ability to administer the hiring and distribution of funds. Over the course of 8 years, the psychiatric hospital budget increased from \$6.5 million to \$60 million and federal research grant funding increased from \$200,000/year to \$13 million/year during this time frame.³

Due to successes at the psychiatric hospital, Mr. Romoff was asked to assist with building the University of Pittsburgh's medical school. He and Dr. Detre applied the same model they used to rescue the failing psychiatric hospital with a focus on using clinical revenue to support research and continually attracting highly qualified researchers and thereby more research funding. In addition, special focus areas were chosen including transplantation. Centralized governance remained a pillar of this model as Dr. Detre was the University of Pittsburgh's associate senior vice chancellor for health sciences which gave him control over the schools of medicine, pharmacy, dentistry, nursing, public health and health-related professions.

As health expenditures consumed a greater percentage of the gross domestic product and private insurers attempted to regulate health care delivery, University of Pittsburgh became concerned about the financial risk assumed with its faculty practice plans. In response to these concerns, the University of Pittsburgh transferred the practice plans and hospital management to an independent nonprofit corporation, the University of Pittsburgh Medical Center (UPMC). The University of Pittsburgh School of Medicine and University of Pittsburgh Medical Center (UPMC) operated with the belief that, "What is good for one is good for both" and, with this governing principle, UPMC and the Pittsburgh School of Medicine have grown to become western Pennsylvania's largest employer and is a \$7 billion global health enterprise. Research growth has been a priority of the enterprise and the institution is in the top 10 of total National Institutes of Health research funding.⁴

During the era of managed care integration 1986-1991, hospital mergers occurred and many administrators were forced to resign or relocate. While some believed this was a sign that the power wielded by Dr. Detre and Mr. Romoff was too great, an inherent concern in centralized governance models, attempts to counterbalance this power were unsuccessful. Few were eager to disrupt the leadership structure as revenue increased from \$85 million to \$518 million.³

Integration of not-for-profit and for-profit business has also factored into the success in Pittsburgh. UPMC owns or is associated with over 100 partnerships and joint ventures (e.g. post-acute care facilities, international businesses, health plans, information technology companies, Sicilian transplant center). In 2005, UPMC sold Stentor Inc., a company that provides technology to allow radiology images to be viewed on personal computer networks, for \$36 million and an agreement with IBM to integrate digitalized images led to a \$402 million agreement illustrating the diverse funding streams available to the enterprise.⁵

In summary, the success realized in Pittsburgh is attributed to an integrated organizational model with a belief that what is good for one part of the institution is good for the entire institution along with a focus on several research areas of specialization and diversification of funding.

Governance Models

A literature review on the role of governance structure reveals some trends toward governance models similar to the model used in Pittsburgh. First, there has been a shift towards a single-leader model in many AHCs.¹ Second, funding streams flow across AHCs. For example, clinical service revenue flows from the hospital to the medical school to compensate clinical faculty. This requires leaders of both units to cooperate and, ideally, to share a vision for the organization as a whole. However, it is crucial to note that these units run under fundamentally distinct business models with differing objectives.¹ Third, there is the suggestion that many of the issues faced by AHCs in the United States carry over to AHCs internationally.⁶

AHC Responses to Shifting Economic Pressures

Stimpson et al. (2014)⁷ suggest a typology of three classes of solutions to the challenges facing AHCs: economic, government intervention, and system reform. Examples of economic solutions would be to develop systems of reimbursements that more closely match actual costs of services and increasing operational efficiency. Government solutions include more price regulation and increased government investment in the social mission and education at AHC. This includes, for example, better General Medical Education reimbursement models. System solutions include utilization of industrial management tools and improvement in the communication and decision-making processes.

Domestic and International Trends in Research Funding

A discussion of the approach universities are taking to sustain research funding is not complete without placing it in the context of total US and global research funding.

Total U.S. funding for medical research represents 4.5% of total health care expenditures and 2.8% of the gross domestic product is spent on all research and development.⁸ Total funding from public and private sources increased 6% per year between 1994 (\$17.6 billion) and 2004 (\$35.6 billion) but slowed to 0.8% per year in the years that followed through 2012. This decrease equates to a 13% decrease in NIH purchasing power since 2004 while the share of Asian economies devoted to research increased by 7%. A tripling of research funding from Asia resulted in a decline in US government research funding as a proportion of total global funding for research from 57% in 2004 to 50% in 2012. Service innovation or health services research receives 0.3% of total health care expenditures. In contrast to other countries where health systems and insurers conduct and finance service innovations, private insurers contributed only 0.04% of revenue to research and health systems 0.1% of revenue. Of note, provisions within the Affordable Care Act were designed to fund outcomes research using a combination of treasury funds and a portion of revenue generated by health insurance policies. (Patient-Centered Outcomes Research Institute)

Foundations, charities and other not-for-profit entities providing research support are few in number with 42% of the total provided by only 10 public medical charities and 10 private foundations. The United States declined from 6th in 2000 to 10th in 2012 among 34 countries participating in the Organization for Economic Cooperation and Development members in the proportion invested in research and development.⁸ A decline in most valuable patents from 73% in 1981 to 59% in 2011 is also a key indicator of the effects of globalization on US research. Furthermore, one medical school estimated expenses generated by increasing regulatory requirements increased by 300% while direct programmatic funding declined.⁹

Clearly, alternatives to traditional research funding are needed as discretionary federal funds diminish. Sustainable research funding strategies have been developed by the United Kingdom (BIS Allocation of Science and Funding), Japan (Comprehensive Strategy on Science, Technology, and Innovation, 2014), Singapore (Research,

Innovation and Enterprise 2015), Denmark (Research 2020), and the European Union (European Commission. What is Horizon 2020?).

Recommendations to Provide Sustainable Research Financing

Recent trends in research funding growth have prompted recommendations for new funding mechanisms to include:

1. Tax provisions allowing companies to return foreign held capital to the United States if designated for research.¹⁰
2. Biomedical research bonds issued by federal, state or local governments with amortization from patent royalties or conversion to equity in new companies similar to bonds used to fund new stadiums.¹¹
3. Research innovation trusts combining private and public funds in return for tax credits similar to those used for land preservation modeled after trusts used for research in Australia, Canada and the United Kingdom.
4. Tax designations allowing individuals to specify that a portion of their tax payment be used for research using the examples provided in California, Maryland, New York and Oregon.
5. The Academy of Arts and Sciences Report *Restoring the Foundation* recommends permanent tax credits for businesses that engage in research and development.¹²
6. Joint ventures between universities, governments, industry and philanthropies to set and fund research agendas (e.g. Joint Technology Initiatives run jointly by European leaders and CEOs of corporations involved in technology and drug development)

Another key finding from the literature was that a substantial reorganization requires a catalyzing traumatic event. One example of this is the Hershey Medical Center and Pennsylvania State College of Medicine in Hershey, Pennsylvania. After a failed merger attempt between the Medical Center and Geisinger Medical System in the 1990s, there was a willingness to transform the governance structure of the Hershey AMC. The Hershey experience is nicely detailed in Kirch et al. (2005).¹³ However, this suggests that structurally significant reorganization cannot occur without, metaphorically speaking, a “near-death” experience for the AHC. Ideally, the institution would not await a “near-death” experience akin to that of the psychiatric hospital in Pittsburgh or that of the Hershey Medical Center.¹³

The US research budget, much like the University of Colorado School of Medicine research budget, is subject to changing economics and politics. While a centralized governance structure has been extremely successful in Pittsburgh and there is a trend towards fully integrated, single leader models, there is no literature to suggest that this approach is clearly superior to more decentralized approaches. Furthermore, our interviews with stakeholders indicated that relationships, communication and shared vision are more important than organizational structure. However, the literature does support the need for a more sustainable, diversified approach to research funding that does not depend on a “catalyzing traumatic event” and is not subject to changes in

leadership, economics or politics. The literature also clearly outlines vulnerabilities in relying strictly on traditional sources of funding from the NIH.

Based on our stakeholder interviews, a review of organizational structure within the University of Colorado and a review of the literature, we propose the creation of an Anschutz Research Board composed of the Chief Research Officer from UC Health, the Vice Chancellor for Research, and the CHCO Chief Research Officer. (Figure 2) The Anschutz Research Board would report to the Anschutz Executive Council. (Figure 3) The underlying principle of this board's creation is that commitment to research requires embedding research into the highest layers of leadership. Based on our interviews we concluded that no governance structure can overcome a lack of shared vision; therefore, it is imperative to seek an aligned commitment to research among leadership. We also understood from our informants, no governance structure can overcome leaders who cannot get along with one another; therefore, it is imperative to seek effective leaders who respect their peers. Given the importance of research to the academic enterprise and risk of losing both research funding and top researchers due to inefficiencies in research infrastructure, we also conclude that it is necessary to create a system of one-stop-shopping for researchers. Finally, financial forecasting trends clearly demonstrate that traditional sources of research funding are unlikely to be sustainable. Innovative funding strategies are needed to maintain financial viability in a changing global research environment. We believe the Anschutz Research Board should be tasked with integrating shared vision at the highest level of leadership on campus, seek to improve research infrastructure and develop alternative research funding strategies.

Figure 2. Proposed Anschutz Research Board Governance Structure

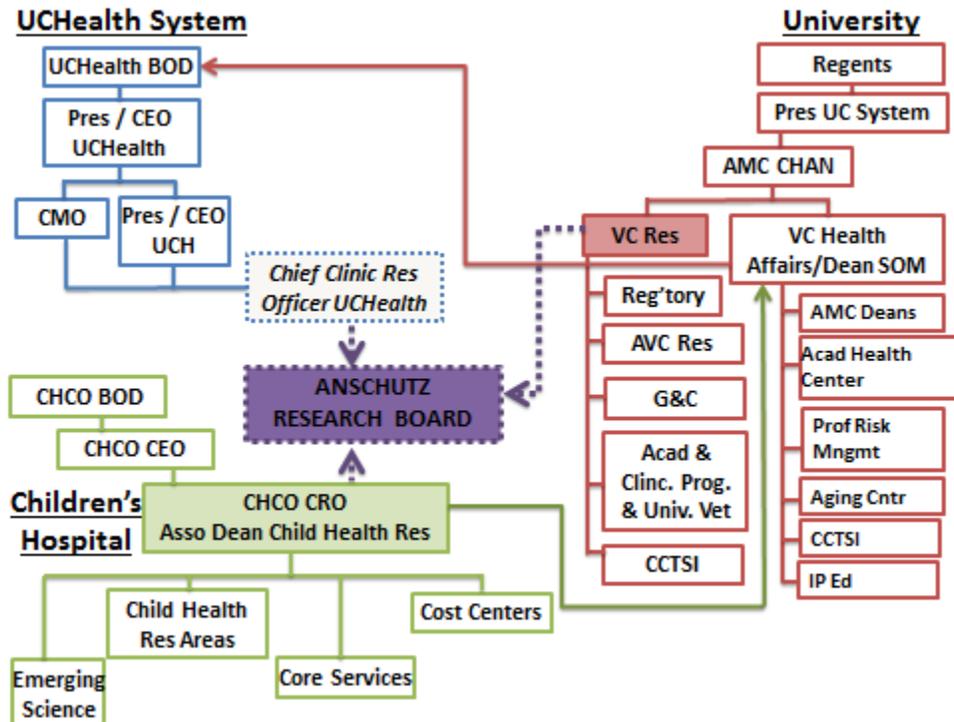
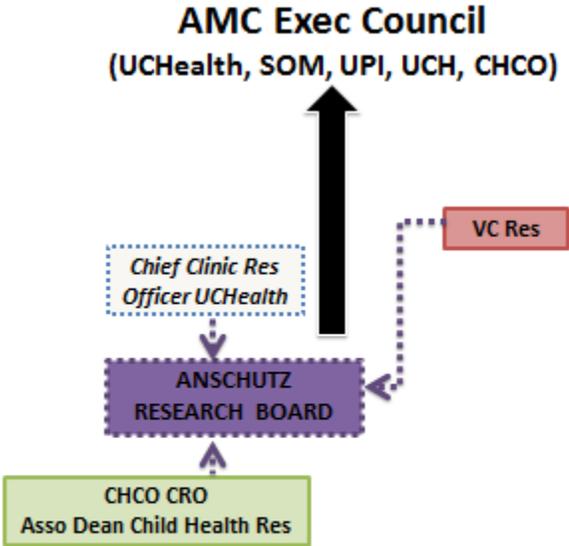


Figure 3. Proposed Reporting Structure for Anschutz Research Board



Reference List

1. Wietecha M, Lipstein SH, Rabkin T. Governance of the Academic health Center: Striking the Balance Between Service and Scholarship. *Academic Medicine* 2009;84(2):170-176.
2. Levin S. Western Psych a perfect place to start. *Pittsburgh Post-Gazette* 2005 Dec 25.
3. Levin S. Empire Building: Consolidation and controversy at UPMC. *Pittsburgh Post-Gazette* 2005 Dec 27.
4. Levine AS, Detre TP, McDonald MC et al. The Relationship Between the University of Pittsburgh School of Medicine and the University of Pittsburgh Medical Center - A Profile in Synergy. *Academic Medicine* 2008;83(9):816-826.
5. Levin S. Empire Building: Expansions and Departures. *Pittsburgh Post-Gazette* 2005 Dec 29.
6. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, governance, and organizational dynamics of university medical centers in the Netherlands. *Academic Medicine* 2010;85(6):1091-1097.
7. Stimpson JP, Li T, Shiyabola OO, Jacobson JJ. Financial Sustainability of Academic Health Centers: Identifying Challenges and Strategic Responses. *Academic Medicine* 2014;89(6):853-857.
8. Studt T, Grueber M. 2012 Global R&D Funding Forecast. *R&D Magazine*, 2011
9. Moses H, III, Matheson DH, Cairns-Smith S, George BP, Palisch C, Dorsey ER. The anatomy of medical research: US and international comparisons. *JAMA* 2015;313(2):174-189.
10. America's Vrumbling Infrastructure - Bridging the Gap. *The Economist* . 6-28-2014.
11. Green Bonds Spring is in the Air. *The Economist* . 3-22-2014.
12. American Academy of Arts and Sciences. *Restoring the Foundation: The Vital Role of Research in Preserving the American Dream*. Cambridge, MA: 2014
13. Kirch DG, Grigsby RK, Zolko W et al. Reinventing the Academic Health Center. *Academic Medicine*. *Academic Medicine* 2005;80(11):980-989.