

MANAGEMENT STRUCTURES OF THE ACADEMIC MEDICAL CENTER

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ABSTRACT

Academic medical centers perform several important functions of the healthcare system by providing patient care, research, and education. Their responsibility is not only to provide quality care to patients today, but also to train new physicians and researchers to deal with the health problems of tomorrow. At their core, academic medical centers function as both hospitals and universities; often, these are separate entities that each have powers and responsibilities over multiple facilities and medical departments. The university will control research and education, while the hospital or health system controls patient care and operations. However, these two entities are frequently intertwined through affiliation agreements, policies and procedures, and management practices. For example, a Department of Surgery in an academic medical center may function as a department of the medical center for its clinical operations and as a department of the university for its research and training operations. This department is thus responsible to and controlled by two bosses, each with separate goals, values, and methods. Having the practice of medicine and the teaching of medicine so closely aligned can have enormous benefits in terms of the resources that both entities bring to the table, but it can also create problems for management. This essay aims to look at departments of the University of Pittsburgh Medical Center (UPMC) and the University of Pittsburgh School of Medicine to examine operational

challenges and benefits to this dual-management approach through an examination of selected projects and tasks that function under the umbrella of the two entities.

Statement of Public Health Relevance:

While organizational management and structure may not be thought of as core functions of public health, it is nonetheless vital to the performance of the health care system in general. A well-run program or medical center can make life-or-death differences to patients. Likewise, proper financial management and cost-savings measures can decrease costs for each individual patient and increase the pool of resources available to the public at large. Academic Medical Centers (AMCs) are arguably the premier medical institutions in the United States, providing quality care in a not-for-profit setting and also conducting impactful and innovative research that has produced some of the most notable cures and treatments of the modern era. At least some share of these achievements can be credited to effective management. As many AMCs have evolved into full-fledged health care networks with multiple hospitals and even their own health insurance plans, management has become ever more complex. As these institutions have grown, so has the internal and external tension between their distinct academic and clinical operations. As the two sides grow together and apart, proper management becomes essential to link their important functions. On an operational level, this “split” can mean more layers of management and more complex approval processes to get routine tasks done. On a positive note, however, the split can also mean that more resources are generally available as divisions and departments have a larger pool to draw from in terms of funding and administrative support. Management’s capacity to align effectively the complementary missions of the AMC will have considerable effect on the lives and welfare of the general public.

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1.0 INTRODUCTION

An Academic Medical Center (AMC) is a medical institution, typically a hospital, that is “organizationally or administratively integrated with a medical school.”ⁱ AMCs are usually affiliated with major universities, and are comprised of a medical school and at least one or more teaching hospitals. While AMCs are by no means the only places where medical education and training take place in the United States, they place increased focus on teaching and research to benefit both the next generation of clinicians and patients. According to the Association of American Medical Colleges, a hospital or university must sponsor at least four medical residency programs in either medicine, surgery, obstetrics/gynecology, pediatrics, family practice, or psychiatry.ⁱⁱ In addition, the AAMC classifies AMCs into eight categories, based on ownership: 1) Hospitals having common ownership with a college of medicine in a comprehensive, public university, 2) Hospitals having common ownership with a college of medicine in a public, health science university, 3) hospitals having common ownership with a college of medicine in a comprehensive, private university, 4) hospitals having common ownership with a college of medicine in a private, health science university, 5) non-profit hospitals owned separately from a college of medicine but in which the majority of medical school chairmen and hospital chiefs of service are the same individuals, 6) non-profit hospitals previously having common ownership with a college of medicine, 7) for-profit hospitals in which the majority of medical school chairman and hospital chiefs of service are the same individuals, and 8) governmental hospitals

owned separately from a college of medicine but in which the majority of hospital chiefs of service are the same individuals. These categories illustrate the various ownership and affiliation structures that exist between medical colleges and universities, and the hospitals where their education and research are put into practice.

AMCs in the United States can trace their foundations to before the Revolutionary War, with the first medical school in America – the College of Philadelphia – being formed in 1766.ⁱⁱⁱ Medical education in the United States was relatively unorganized in the 18th and 19th centuries, with few real standards for physician training or any real models for cooperation between medical schools and hospitals. Johns Hopkins University, established in 1893, was built on a model that the university's medical school would include a hospital for the practical application of its teachings. Following the Flexner Report in 1910, which documented the lack of standards for medical education, more medical schools began to emulate the Hopkins model.^{iv} As America modernized and dealt with two World Wars in the first half of the 20th century, medical education was given a boost by government efforts to treat war veterans and deal with public health issues such as influenza and polio. The Health Professions Education Assistance Act of 1963 initiated government funding assistance for medical education in the form of loans for students and funding for states to construct or expand medical schools. Since that time, the number of medical schools in the United States has increased to 145, and the number of hospitals affiliated with a medical school has grown to over 400.^v

Academic medical centers differ from non-academic hospitals in that they place greater emphasis on teaching, education, and research as opposed to strictly emphasizing clinical care. While clinical care is by no means left out of the equation, care is viewed as a tool for new practitioners to learn the trade of medicine, and as a way to put new research into practice.

Academic medical centers facilitate the greater good by enabling teachers, students, and researchers to “move out of the laboratory and into the community...” and to “...make the journey from efficacy to effectiveness.”^{vi} AMCs may be considered tertiary regional specialty care centers which provide levels of care above and beyond that of community hospitals and offer treatment for a much wider variety of issues than smaller, non-academic health centers.^{vii} Some AMCs may offer physician (MD and DO) training programs, while other “health sciences” universities may offer training in medicine, nursing, pharmacy, dental medicine, rehabilitation, and public health.^{viii} In a management sense, academic medical centers can be just like any other large business, with multiple departments and divisions, but are unique in that the affiliations between medical schools and hospitals may vary in the level of integration between the two.

Academic Medical Centers are important due to their outsized role in medical education, research, and innovation in the United States. Of the twenty 2016-2017 top-rated hospitals according to US News and World Report, all are affiliated with a medical school, with the majority being affiliated with either a state or private university.^{ix} According to the National Institutes of Health research funding data for 2017, the five highest-funded institutions are academic medical centers: Johns Hopkins University, The University of Pennsylvania, The University of Michigan, Brigham and Women’s Hospital (affiliated with Harvard Medical School), and The University of California at San Francisco.^x These institutions provide state of the art care for patients, and are seen as beacons for health research and innovation in the United States. Many important health care discoveries have occurred at university hospitals or at academic medical centers. This essay will briefly examine the history of the academic medical center, the management structures used by AMCs, a description of one AMC and its

organizational structure, and a study of how that organizational structure affects day-to-day operations at an AMC.

1.1 LITERATURE REVIEW – DIFFERENT STYLES OF MANAGEMENT IN ACADEMIC MEDICAL CENTERS

1.2 INTRODUCTION

This literature review will cover the history of academic medical centers in the United States and will discuss and evaluate the organizational and management structures currently used by AMCs.

1.2.1 History and Evolution of Academic Medical Centers

As previously discussed, academic medical centers have existed in one form or another since the founding of the United States. However, hospitals in the 18th and 19th centuries looked nothing like the medical facilities of today; physicians in early America frequently made house calls, and admittance to a hospital usually meant that death was imminent. Medical schools abounded during this time, but standardization was lacking and the bar for entry was low. The University of Michigan is on record as being the first university to own and operate a hospital in 1869.^{xi} The Flexner Report in the early 20th century helped bring standardization to the field of medical education, and universities began to adopt the Johns Hopkins model of a medical school with an affiliated hospital. Wars and public health crises in the early 20th century increased government emphasis on medical education, with the government recognizing a need for more

clinicians. The 1950's and 1960's began to see a shift in the composition of AMCs. Before this time, an academic medical center was thought of as a medical school with a teaching hospital. As universities began to emphasize the "health sciences" rather than just medical education, some academic medical centers evolved into much more complex academic *health* centers.^{xii} Universities realized that health centers could be a vital source of revenue to help fund education and research. Faculty practice plans were developed that allowed health sciences faculty to fund their organizational missions. "As the size and scope of academic medicine grew, universities began to organize the health sciences as a distinct entity requiring dedicated administrative oversight and support..."^{xiii} This was the beginning of the differentiation between the university and the health system that has become prevalent in modern AMCs. As AMCs grew, the complexities of their operations became too great for university administrators to handle on their own. This led to segmentation between the medical school and the health system with each side eventually employing separate management teams and even having separate governing boards. AMCs may adopt different management structures and strategies to deal with the dualism that is inherent to their modern form. The degree to which the two sides are or are not aligned along a continuum of integration helps to drive the style of management that each organization adopts.

1.2.2 Management Structures – Dualistic and Pluralistic Management

Management of the modern AMC in the United States can be classified according to how the university or medical school is connected to the teaching hospital or health system. Smaller universities with perhaps only one teaching hospital may operate that hospital as an extension of the university; it may be owned by the university, administered by the university, and governed by the same board of directors that governs the university. This simpler model of AMC

management could be described as dualistic or pluralistic. The dualism is expressed by the medical faculty having the dual mission of performing clinical work and education or research. Clinicians report up to university deans and hospital presidents, who may or may not be the same person. Divisions may be most prominent in administrative duties, and less prominent in education if the education is closely tied to patient care in the form of residency supervision and not strictly classroom learning. This dualism extends down the organizational chart to administrators and staff, who, in a smaller AMC, may find themselves responsible for a combined budget that incorporates the activities of both a teaching hospital and a university medical school.

Pluralism in an academic medical center extends from high-level and system-wide strategic initiatives down to department-level budgeting. Starting at a strategic level, pluralistic management can make it challenging for the academic medical center to act as one integrated organization. Depending on an organization's history and the degree to which collaboration and coordination are desired outcomes, university teaching goals and health system clinical goals must be effectively aligned in order for stakeholders and the general public to perceive the two institutions as one united entity. An additional complicating factor is that many academic medical centers receive considerable public funding. As such, another set of stakeholders is introduced into the mix: governmental agencies and the tax-paying public, whose funds support the mission and operations of the AMC.^{xiv} Furthermore, as one of the core activities of an AMC is research, AMCs are also beholden to funding agencies. Research funds bring in not only funds to directly support research activities (labs, investigator salaries, etc.) but also pay for indirect costs such as staff support, facilities upgrades, and faculty discretionary funds. In terms of strategy, AMCs have competing external images (for example, a non-profit university and a

seemingly for-profit health system) that must be integrated into a clear and compelling message. Because AMCs tend to be pillars of their local communities, public relations and reputation must also be taken into account. If goals and strategies are not properly aligned, the public may start to think of the center as disorganized or imbalanced, prioritizing one component of the mission over the other. External stakeholders can wield great influence over an AMC, and care must be taken to form a unified strategy that identifies the university and the health system as one entity, or a close affiliation linked by compatible missions, goals, and values.

The influence of internal stakeholders may provide a much greater degree of pluralism in strategy formation and management than do external stakeholders, due to the effect of organizational culture on structures, norms, and processes. These structures reflect two sets of competing interests and values; medical and administrative, and education and clinical.^{xv} The battle between medical and administrative personnel is ever-present, and the perils of this battle are well known. In the context of the AMC, however, it also becomes apparent that there can exist a structural battle between administrators that exists as a result of two entities having different priorities. While the pressures of external stakeholders on AMCs are arguably greater because of their public nature and nonprofit status, internal stakeholder pressure is also prevalent in the modern AMC.

The study of pluralistic management has often been applied to healthcare because of the many decision-makers and decision points involved in providing patient care. “Health care is a classic pluralistic domain involving divergent objectives (individual patient care, population health, and cost control) and multiple actors (professionals, administrators, community groups, and politicians) linked together in fluid and ambiguous power relationships.”^{xvi} Ambiguity in management can lead to efficiency and duplication of duties at a minimum, or even disparate or

conflicting orders or goals at worst. Leadership roles in pluralistic environments may be diminished by the fact that more than one leader may have responsibility for essentially the same task or function. In the case of an academic medical center, this situation may manifest itself when medical faculty report to a department administrator on the university side and a practice manager on the health system side. Unless roles are very specifically laid out, this makes it difficult for the faculty to know where to turn for resources and approval. They may make a request of their department administrator, only to be told that the decision involves the health system and must be resubmitted to their practice manager. This example suggests how parallel management structures may dilute or constrain the authority of both management roles, which can result in waste, conflict, and inefficiency within the organization as a whole.

For a dual-organization like an academic medical center to act as one integrated entity, its employees, customers, and the broader public must perceive it as a unified organization. Leaders from each of the two domains of the whole must cooperate and coordinate with each other, while observing the boundaries of their own authority and scope of responsibility. “Strategic leadership is viewed as a partly supraorganizational phenomenon in which leadership roles and influences on them extend beyond focal organizational boundaries... this perspective is particularly salient for organizations that form parts of an interrelated pluralistic network, as do health care organizations... Thus, collective leadership must mobilize support and manage relationships not only within the organization, but also outside it, within its network (government bodies, other health care organizations, community and so forth).”^{xviii} In order for integration to be affected, the parallel structures and processes of each side must to some degree be integrated to maintain a strategic direction. In the case of the University of Pittsburgh School of Medicine and the UPMC Health System, this supraorganizational practice is exemplified by departments within the

medical school that share an executive administrator with their corresponding department in the health system. This administrator is employed by both the medical school and the health system, and has a fiduciary duty to act in the best interest of each. This arrangement may be imperfect in departments that have more delineation between the two entities, such as departments with large numbers of university-only research staff. However, departments with more balanced university and health resources, functions, and employees may perceive the department administrator as reflecting a unified mission and set of values rather than a division of competing interests between the university and the health system. Having one leader for the dual departments increases administrative efficiency and makes it clear that the two organizations really act as one.

Allowing greater independence between the university and the health system can foster more innovation and creative leadership, but care must be taken not to cause an irreparable split across the organization. Governance across the university and the system must be structured to allow individual units to act independently while preserving the authority of higher powers at higher levels. “Effective governance systems strike a delicate balance between promoting independent initiative and facilitating coordination of center-wide activity and collective action. Independence can be readily promoted at the medical school level by granting autonomy to department heads in such areas as faculty compensation and space allocation. It is more problematic to place sufficient unobtrusive restrictions on departmental autonomy to facilitate concerted action...”^{xviii} One area where both independence and organizational coordination may come into conflict is an AMC’s information technology infrastructure. Often, each side of the AMC will have its own set of IT needs, some of which are common to the AMC as a whole and some of which are unique to different business, education, and research units. The IT teams of the university and the health system must have sufficient independence while recognizing their

degree of interdependence so that these units can proactively work together to solve shared problems. However, each must serve the overall IT strategy and goals of their respective organizations. For example, the university and health system IT teams may independently collaborate on data wiring in a shared building, but also need to respect the bounds of their respective projects and further their separate goals.

Table 1. Advantages and Disadvantages of Dualistic-Pluralistic Management

Pros	Cons
<ul style="list-style-type: none"> • Dualism – only two lines of command 	<ul style="list-style-type: none"> • Allows for only two lines of command
<ul style="list-style-type: none"> • Easier for one person to act in two roles 	<ul style="list-style-type: none"> • Competing power structures
<ul style="list-style-type: none"> • Works for smaller, more integrated institutions 	<ul style="list-style-type: none"> • Not ideal for larger institutions such as health systems

1.2.3 Management Structures – Matrix Management

The concept of matrix management has become more prevalent in healthcare as organizations have become larger and more complex. A matrix is, by definition, something that is multiple, i.e. not singular, and differs from dualistic or pluralistic management in that there may be more than two management structures or lines of authority in place. “Matrix organization, a system characterized by a form of management with multiple chains of command. Unlike a traditional hierarchy in which each worker has one supervisor, a matrix system requires employees to report to two or more managers, each responsible for a different aspect of the organization’s overall product or service”^{xix} An academic medical center, with its university and health system sectors, fits the description of a matrix organization because, within

those two entities, there may be multiple reporting structures that transcend the boundaries of each side. For example, a project manager who is a health system employee may be tasked with performing a human resource task, eg., a salary change, for a faculty member. This person is a member of the medical faculty of the health system and teaching faculty of the university and is paid by both entities. The project manager will have to perform administrative duties and paperwork for both entities in order to affect proper payment. On its face, the task of the project manager has a dualistic function. However, the matrix structure becomes apparent when you recognize that the project manager must report the salary change to his or her immediate supervisor, the faculty member's supervisor, the human resource and compensation teams of both entities, and the faculty member's department chair for both the health system and the university. Even if the department chair serves the same role for both the university and the health system, the project manager must interact with four distinct hierarchies of review and approval in order to affect the salary change.

Matrix management entails distinctive organizational frameworks, yet it also requires a shift in the way employees and managers think about their jobs. A matrix organization should encourage its members to consider their roles and behaviors from the perspective of their particular work groups and business units. The matrix organizational structure is a tool that can be used to manage ever more complex businesses: "Its parallel reporting relationships acknowledged the diverse, conflicting needs of products and processes, and provided a formal mechanism for resolving issues and problems. Its multiple information channels allowed the organization to capture and analyze complexity. And its overlapping responsibilities were designed to combat parochialism and build flexibility into the company's response to change."^{xx} In an academic medical center, matrix management can be applied so that employees of one side

of the organization also recognize the welfare and goals of the entity as a whole. University personnel may get caught up in always doing what is “right” for the university, without considering the broader benefits associated with having an integrated health system. Likewise, health system personnel may not recognize the research funding and esteem that affiliation with a research-focused university can provide. “Developing a matrix of flexible perspectives and relationships within each manager’s mind... lets individuals make the judgements and negotiate the trade-offs that guides the organization towards the shared strategic objectives.”^{xxi} Applied to the example of the faculty salary change, a matrix perspective will allow and encourage the project manager to view both perspectives when looking to fund the faculty member’s salary. Compensation and funding issues can affect both sides of an academic medical center, so a systems perspective – as entailed by effective matrix management – can help individual employees and managers make financial decisions that benefit more than one department or business unit. Broadly speaking, matrix management in an academic medical center helps to achieve cohesiveness across the university and the health system, and works to bring these domains together as a strategic whole.

Matrix management has definite advantages for healthcare organizations, and may indeed be one of the only practical forms of management in increasingly complex integrated delivery and financing systems (IDFSs). As service lines become more intermingled and as traditional healthcare organizations offer more and more services, it is inevitable that management will become more complex. In an academic medical center, one can argue that this has always been the case; sharing staff between the university and the health system is nothing new, and, depending on the organization, the line between the two has always been blurry. Matrix organization gives entities like an academic medical center greater flexibility to carry out their

vast array of business dealings: “The matrixed organization develops a ‘double management and command structure’ that provides greater visibility, stronger governance, and more control in large, complex companies.”^{xxii} Governance and oversight can be increased, because typically there is more than one manager overlooking each employee. Matrix management can also be beneficial to employees, who are arguably exposed to a wider variety of tasks and procedures than they otherwise would be. This allows for greater cross-training of employees and can help to “tear down the silos” of rigid healthcare service line hierarchies. A project manager who is responsible for departmental human resource functions as well as research administration is arguably better for it, having developed multiple skills that can give her or him a competitive advantage when looking to move up within the organization. In an academic medical center, an employee trained and capable of performing both health system and university function is a more valuable employee than an employee who only knows how to perform a narrow range of tasks. This allows for greater flexibility with staffing choices, as matrix management allows managers to use their employees more flexibly and efficiently. Should a staff member resign, retire, or suffer an illness or injury, it can be more efficient to train other employees to each do elements of the absent staff member’s job than it would be to bring in a temporary employee or to hire a new person. Likewise, new employees must be expected to do more in a matrix organization than they would in a traditional hierarchy. In an academic medical center, new employees cannot expect to only handle one side of the business just because their salary comes from one side or the other; rather, they should expect that their position and their work will transcend the organizational boundaries.

Matrix management also presents challenges to the healthcare organization and the academic medical center specifically. More lines of command and control dilutes the authority of

any one manager or employee. A more complex structure such as the matrix also increases complexity when trying to accomplish any one task. If the task requires the input of more than one supervisor, business line, or entity, then conditions are ripe for inefficiencies and redundancies. “The two-boss matrix system defies traditional notions of unity of command and authority equaling responsibility. It also introduces ambiguity and difficult-to-manage balances of power. Matrix organization can also have different faces as balances are struck between functional management and program management methods.”^{xxiii} Matrix management assumes that the “two bosses” are of equal stature and influence within the organization, but what happens when they are not? For example, if a project manager reports to a department administrator on the health system side of an AMC, but an associate dean on the university side, the project manager may be more likely to respond to the associate dean because of his or her position in the hierarchy? The vice-dean, naturally. Conversely, the vice-dean may require much more from the project manager, and have the organizational influence to override the health system administrator on a common issue that involves the employee. Also, having two bosses on an organizational chart does not mean that the employee will regularly report to both. It is possible that, for budget reasons, one administrator may put one of his or her employees under another business unit and administrator, while the employee will mainly report to the first administrator. Often these are arrangements of convenience depending on whose department has the resources to add additional employees. The two-boss arrangements also do not necessarily mean that each boss will have equal requirements for their shared employees. Matrix management allows for more flexibility in an academic medical center, yet power imbalances within the matrix can cause confusion.

Table 2. Advantages and Disadvantages of Matrix Management

Pros	Cons
<ul style="list-style-type: none"> • Allows greater flexibility in job duties 	<ul style="list-style-type: none"> • Diffuses power and responsibility across the organization
<ul style="list-style-type: none"> • Exposes employees to more organizational function and is ideal for cross-training 	<ul style="list-style-type: none"> • May be disagreement between mission, goals, and values of each side of the matrix
<ul style="list-style-type: none"> • More accommodative of inherent differences in university vs. health system operations 	<ul style="list-style-type: none"> • Disparate job duties and responsibilities can lead to employee confusion

1.2.4 Academic Medical Center Structure

At its core, an academic medical center is comprised of a university or medical school that handles education and research, and a teaching hospital or health system that cares for patients, educates the next generation of clinicians through residency programs, and pursues research through clinical trials and affiliations with the university. Each academic medical center is organized in a different way, but there exist commonalities in terms of how closely the two entities are united and how inter-organizational business is conducted. “The organizational structures of academic health centers (AHCs) vary widely, but they all exist along a continuum of integration – that is, the degree to which the academic and clinical missions operate under a single administrative and governance structure... Proponents of full integration under unified leadership and governance argue that it makes sense for a number of reasons. First and foremost, full organizational integration facilitates strategic focus... A second reason full integration may make sense is that the academic missions of the AHC can be substantially advanced with the

financial support that the clinical enterprise has traditionally been able to provide.”^{xxiv} Among academic medical centers, full integration seems to be more practical in smaller organizations that may only have one teaching hospital and a medical school. As AMCs get more complex, with multiple hospitals, research centers, health sciences schools, and even employed physician groups, organizational integration may have to become more loosely coupled. Matrix management can assist as organizational relationships become more complex, but it is clear that academic medical centers are moving away from centralization as they grow.

There are two basic types of academic medical center governance models: single leadership and multiple leadership.^{xxv} Single leadership AMCs typically have one fiduciary board and one team of executive leaders, with the university hospital and physician groups falling under the leadership of the university. The multiple leadership model is characterized by the university and the hospital or health system each having separate fiduciary boards and separate executive leadership teams. As is the case at the University of Pittsburgh Medical Center, the multiple leadership model may allow for some overlap between the two entities. Most academic medical centers started out with single leadership, but the post-World War II changes in the healthcare market forced a shift towards multiple leadership. “...the growth of commercial health insurance in the 1950s and the emergence of Medicare and Medicaid in the 1960s set the stage for clinical revenue growth. University structure quickly proved a poor foundation for the operation of a competitive clinical business.”^{xxvi} Under the single leadership model, education and research almost always resulted in financial losses, but with the rise in clinical profitability during this time, academic medical centers realized that separating their clinical enterprises from education and research could allow them to remain solvent or even profitable. However, this arrangement has the potential to lead to strife in how the profits are

allocated across the organization: “Hospitals’ financial success has led to contention over how best to allocate monies across the clinical, research, and educational missions. This has been particularly so in the multiple-leader models, in which AHCs are necessarily governed across a matrix of ‘separate but inseparable’ organizations, bound together through a complex web of financial interdependencies.”^{xxvii} According to Wietecha, Lipstein, and Rabkin, funds flow through academic medical centers in the following way: from payors to the hospital, from the hospital to the medical school, and from the medical school to the university at-large. Funds from payors are used to support clinical faculty who then transfer the funds to the medical school in the form of faculty salaries, administration of medical education and residency programs, and special “dean’s taxes” that cover administrative and professional fees. From the medical school, the funds flow to the larger university through overhead costs for shared administrative functions, space allocation and facilities management, and the support of athletic and library facilities. In order for this arrangement to be successful, the two “sides” of the AMC must be highly collaborative, with executive leadership that communicates regularly and effectively, and that does not favor one side over the other. Single leadership models tend to work better to combat favoritism between the two sides, but does not function as well as the system grows.

1.2.5 UPMC as a Model of Matrix Management

UPMC employs a matrix management model that helps govern the organization as it grows. During its acquisition phases, “UPMC also introduced the matrix organizational model to the newly integrated hospitals. Under this model, whereas the hospital CEO had responsibility for managing a specific facility, every hospital’s administrative and clinical staff reported both to the hospital CEO and to the corporate-level executive who oversaw system-wide operations in

their area of responsibility, just as each hospital's CEO reported to the UPMC president.”^{xxviii} In terms of staff who are further down the organizational chart, the fact that department chairs have dual-reporting relationships to both UPMC and the University of Pittsburgh entails that administrators and staff to also perform work for both organizations. While on paper, an administrator may only have one supervisor, that supervisor, a department chair, for example, may be accountable to two authority structure, the health system and the university. The support staff of these chairs must necessarily perform work for both entities since their chair is effectively two bosses in one. For other staff, then, their “two bosses” in the matrix relationship are the two organizations that they serve, and whose competing policies, procedures, goals, and requirements affect their work life and performance.

The University of Pittsburgh and the UPMC Health System are also closely related in terms of their governing boards. Through the terms of their affiliation agreement, each entity is allowed to appoint a certain number of members to the other's board. For example, the University of Pittsburgh appoints one third of the members of the UPMC board of directors. This arrangement brings the two entities closer together at the top of the organizational chart, and can help each side align its priorities, strategies, and goals. However, having some of the same members on both boards could potentially result in conflicts of interest and in stagnation due to the same ideas and opinions being presented to both sides of the organization.

University of Pittsburgh School of Medicine department chairs are also clinical department chairs in the UPMC physician group, known as University of Pittsburgh Physicians. For a department such as anesthesiology, the department chair coordinates both educational and clinical activities, and reports to both the dean of the school of medicine and to the president of the UPMC Physician Services Division (name recently changed to Health Services Division). In

this way, the organizational hierarchy splits above the department chair, only to realign at the very top of the organization, where shared board appointments help to keep the two entities together.

One very practical way that the UPMC Health System and the University of Pittsburgh can coordinate so closely is that they share a physical campus. UPMC's flagship teaching and research hospital, UPMC Presbyterian, is physically connected to the University of Pittsburgh School of Medicine. This enables leadership on both sides to easily and frequently collaborate, and preserves open lines of communication between the two entities. The matrix is perhaps at its strongest point when the two sides are so geographically proximate. If it is necessary to have two supervisors in the matrix structure, then it is helpful if those supervisors share the same address.

1.2.6 Organizational Relationship between Pitt and UPMC

The following chart details the organizational structure and affiliations between the UPMC Health System and the University of Pittsburgh School of Medicine. Per the organizations' matrix structure, the two sides of the entity are linked on more than one level, from joint board appointments at a high level to shared leadership within the different divisions.

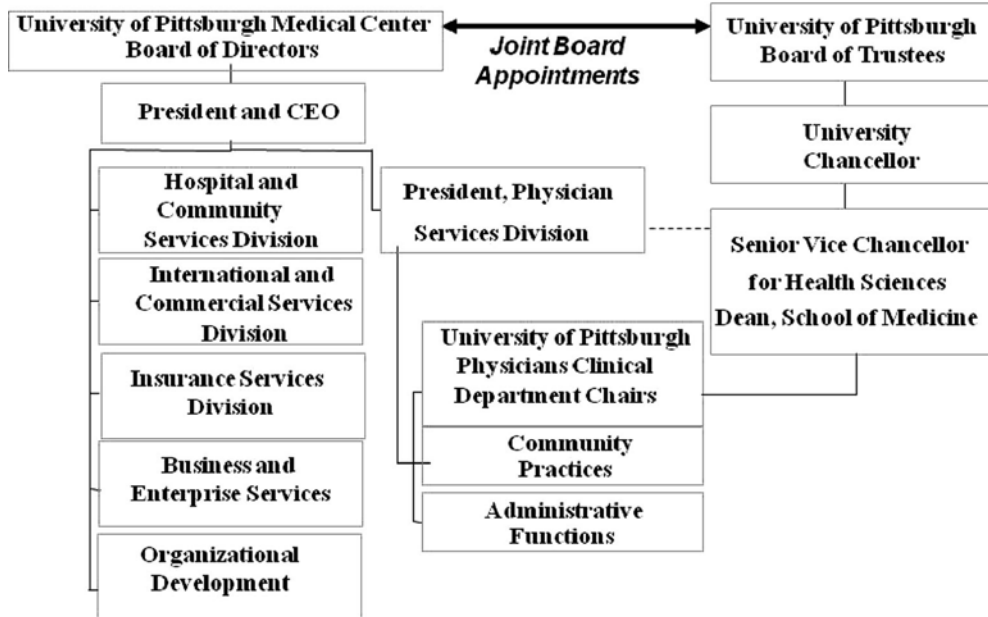


Figure 1. University of Pittsburgh and UPMC Relationship Chart

1.2.7 Penn State Health: A Contrasting Model

The Pennsylvania State University College of Medicine and the Milton S. Hershey Medical Center comprise the Penn State Medical Center, a single-hospital academic medical center in Hershey, Pennsylvania. The medical school was founded in 1967 with private and public grant money, and the medical center opened in 1970.^{xxix} Since its founding, the Penn State Medical Center has always existed under the umbrella of the Pennsylvania State University. State College, Pennsylvania, the site of the main campus of the university, sits in the middle of a wide rural area with few nearby hospitals. Hershey, Pennsylvania is located outside of the state capital of Harrisburg, but is also far-removed from the state's two main population centers, Philadelphia and Pittsburgh. While Penn State Health is older than the University of Pittsburgh Medical Center, Penn State Health unlike UPMC has not grown beyond its core teaching hospital.

Although this may be in part a result of the local geography, it should also be noted that the University of Pittsburgh School of Medicine has been around for much longer, having been founded as the Western Pennsylvania Medical College in 1886, while Penn State Health has not had the same amount of time to expand its network.

The Penn State Medical Center's matrix management differs in some respects from UPMC. The Penn State Medical Center exists as a division of the Pennsylvania State University, with Milton S. Hershey Medical Center reporting to the president of the university.^{xxx} The health system leadership also fulfills dual roles at both the health system and the university. For example, the current dean of the Penn State College of Medicine, A. Craig Hillemier, is also the chief executive officer of Penn State Health. The associate vice president of medical center development also acts as the development officer for the university and for the health system.^{xxxi} Ultimately, this does not represent a matrix structure because the health system is fully integrated with the university. There is one final authority for both the medical school and the hospital, i.e. the university president. More importantly, the medical school and health system are governed by the same entity, the Pennsylvania State University Board of Trustees. Employees of the health system are employees of the university, so there is no situation of having two parallel lines of authority which is central to a matrix organization. There is an element of dualism in this management structure, as physicians and other employees have both clinical and educational responsibilities. In the end, however, those employees still report to one entity.

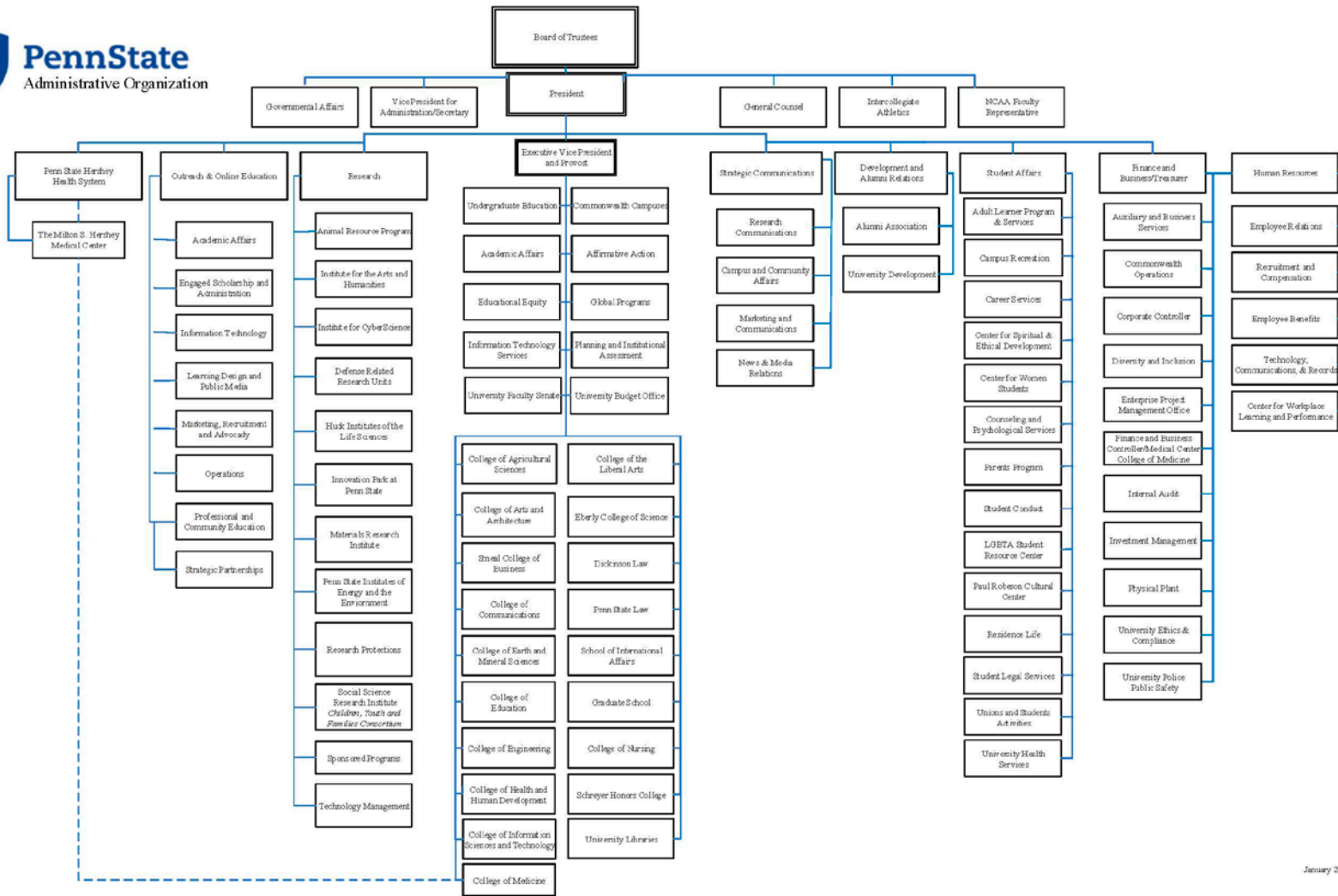
It is also important to note that, unlike the University of Pittsburgh and UPMC, Penn State does not organize its medical school under a senior vice chancellor or vice president for the health sciences. Rather, the medical school, along with other graduate and undergraduate schools such as law and engineering, is placed within the office of the Executive Vice President and

Provost. This arrangement arguably gives the university more control over the activities of the medical school and the health center, as there is one less layer between those entities and university administration. At the University of Pittsburgh, the Senior Vice Chancellor for the Health Sciences, who also serves as the dean of the medical school, holds a very powerful position, with authority over not only the medical school but all other health sciences-related schools including nursing, dental medicine, public health, pharmacy, and health and rehabilitation sciences. The Senior Vice Chancellor also sits on the health system's (UPMC's) board of directors, further increasing the interplay between the two entities. Penn State's approach to managing its medical school and health system is more centralized, and allows for greater university control over the health system.

While governance may be more centralized at the Penn State Medical Center, one barrier to integration, perhaps unique to this organization, is geography. Penn State's main campus is located in State College, Pennsylvania, while the medical school and health system are located in Hershey, PA, separated by over 100 miles. In this way, it could be said that the medical school functions more like one of Penn State's many branch campuses that are located throughout the state of Pennsylvania. This makes integrated leadership especially difficult if medical school and health center executives must constantly be travelling to the main campus for meetings with the university president or with the university's board of directors. In this way, it may be possible for the medical school and health system to still exert some independence from the university. However, it should be noted that advances in telecommunications and video conferencing services, such as Skype and FaceTime, may help to drive integration across this geographic span. In Pittsburgh, the University of Pittsburgh School of Medicine and UPMC's flagship hospital – UPMC Presbyterian – are situated adjacent to one another with walkways on numerous floors

physically connecting the two. In a very practical sense, this allows for greater integration between the university and the health system, because leaders and employees of both can easily cross the organizational boundary by simply stepping through a door.

The following chart details the organizational structure of the Penn State Health Center; specifically, how both the medical school and hospital fall under university administration.



January 2016

Figure 2. Organizational Relationship between Penn State and Penn State Health

1.3 THE MATRIX IN PRACTICE – UPMC DEPARTMENT OF FAMILY MEDICINE

1.4 INTRODUCTION

Academic medical centers, with their many layers of management and differing goals and priorities, can present a challenging operational environment for implementing projects and programs efficiently. While not every division or department of the organization interfaces with the other side, many are required to do so. Workers on one side of the division are likely to have some interaction with the university or the health system. For medical staff the delineation and separation between the two may be more pronounced, since a medical assistant in a physician's office may have no need to work with medical school personnel on a regular basis. However, it may be that the medical assistant works for a physician who is faculty in the medical school of the AMC, and as such needs to take the faculty member's teaching responsibilities into account when scheduling and interacting with patients. Furthermore, that physician's practice may reside inside a university-owned building, and if a pipe leaks then health system personnel have to call university maintenance personnel. Such routine interfaces between staff, policies, and procedures may be more frequent than would be expected.

As previously discussed, UPMC is organized as a matrix organization, with various interplays between the university and the health system. The following narrative aims to describe how the matrix is put into practice on a practical, day-to-day level, and how matrix organization can both impede and encourage efficient operations in a combined department.

1.4.1 A Brief History of UPMC

The University of Pittsburgh School of Medicine and the University of Pittsburgh Medical Center (UPMC) functions under a model of multiple or shared leadership. UPMC started out with a single hospital, the Western Psychiatric Hospital and Clinic (WPIC) that began to be run by the University of Pittsburgh in the late 1940's. By the 1970's, WPIC needed new sources of revenue and upgraded infrastructure to place it at the leading edge of psychiatric services, so the hospital director looked to develop the clinical and financial relationship with the university. The desired goals were to reinvest any excess clinical revenue into the hospital in the form of staff recruitment, research, and enhancements to patient care, and for the hospital to retain funding equal to the amount of indirect costs from government grants.^{xxxii} This model worked well for the psychiatric hospital, and, as the number of hospitals affiliated with the university grew, the WPIC director was asked to become the university's Senior Vice Chancellor (SVC) for the health sciences, giving him authority over the hospitals. The three hospitals of the university, Presbyterian University Hospital, Eye and Ear Hospital, and WPIC were later grouped into the Medical and Health Care Division (MHCD) of the University of Pittsburgh, which assumed management responsibility over them. In 1992, with the acquisition of the struggling Montefiore Hospital in Pittsburgh, the MHCD changed its name to the University of Pittsburgh Medical Center or UPMC.

Research funding and clinical revenues continued to grow in the 1990's, as did UPMC's footprint, which reached 16 hospitals during this timeframe. The continued success of the growing organization led to a more precise specification of the relationship between the University of Pittsburgh and UPMC was. It is important to note that the parent corporation that became UPMC had always been independent of the university, yet the two were almost

inextricably linked through funding, leadership, and administration arrangements. In 1997, an agreement between the two entities was signed that had four core components: a reorganization agreement, an academic affiliation agreement, a trademark license agreement, and a support services agreement. The reorganization agreement moved clinical and administrative functions and responsibilities to UPMC and away from the university and defined asset transfer procedures between the two. The academic affiliation agreement ensured the commitment of the two entities to each other, and laid out the terms for UPMC's financial support of the university. The trademark license agreement allowed UPMC to use the name of the University of Pittsburgh and its seal, while the support services agreement set forth procedures for the two entities to provide shared support services to each other.^{xxxiii} This agreement forms the current basis of the relationship between the two, based on the assumption that what is good for one entity is good for the other.

The structure of shared governance between UPMC and the University of Pittsburgh is based on the sharing of board members between the two organizations, and inter-reporting relationships amongst top university and health system executives. According to UPMC, one-third of the UPMC system's board of directors are appointed by the University of Pittsburgh, while the university's Senior Vice Chancellor for the Health Sciences (also the dean of the Pitt School of Medicine) sits on the UPMC system board, and the UPMC system board chair serves on the board of directors of the University. This arrangement, combined with the contractual obligations set out in the affiliation agreement of 1997, allows for shared governance between the two entities. Administratively, clinical department chairs within the School of Medicine report to the Senior Vice Chancellor, but also serve as the chairs of their departments within UPMC, and also report to the president of the UPMC Health Services Division. Departments

within the Health Services Division, such as Medicine, Surgery, and Pediatrics, have faculty who are both UPMC clinicians and University of Pittsburgh School of Medicine clinical, teaching, and research faculty. These faculty members are compensated separately by each entity, and have different responsibilities depending on whether their focus is on research and education or on clinical practice.

UPMC's clinical revenues help support the School of Medicine financially. In 2007, UPMC contributed \$135 million to the School of Medicine, out of over \$6 billion in revenue. UPMC also contributes to construction costs for labs and other facilities, recruitment bonuses for department chairs, and supports endowed chair positions.

1.4.2 Timeline of UPMC Development

- 1787 – University of Pittsburgh founded
- 1886 – Pitt SOM founded as Western Pennsylvania Medical College
- 1949 – Pitt takes over management of Western Psychiatric Institute & Clinic (WPIC)
- 1954 – Senior Vice Chancellor for the Health Sciences position created
- 1965 – University Health Center of Pittsburgh (UHCP) formed – consisted of Presbyterian University Hospital, Magee-Womens Hospital, Eye & Ear Hospital, and WPIC
- 1986 – Reorganization of UHCP into Pitt Medical and Health Care Division (MHCD)
- 1990 – UHCP acquires Montefiore Hospital and the Pitt Board of Trustees renames MHCD as the University of Pittsburgh Medical Center (UPMC)

- 1997-98 – New affiliation agreement formed between Pitt SOM & UPMC that leads to the relationship in its current form
- 2001-2008 – Mercy Hospital and Children’s Hospital of Pittsburgh join UPMC, and 20-year affiliation agreement is renewed
- 2018 – Affiliation agreement comes up for renewal^{xxxiv xxxv}

1.4.3 Structure of the Department within UPMC

The Department of Family Medicine sits within both the University of Pittsburgh School of Medicine and the UPMC Health Services Division. The department’s university operations consist of teaching and research activities, while its UPMC operations consist of clinical activities in two community clinics, the Mathilda Theiss Family Health Center and the Squirrel Hill Family Health Center. The department is headed by a Chair who oversees the education and clinical activities of the department and by an Executive Vice-Chair. Functioning under these individuals is the department’s Executive Administrator, who oversees administrative operations for both the university and health system activities of the department. The Chair, Executive Vice-Chair, and Executive Administrator are all employees of both the university and the health system. The Chair reports to the Dean of the School of Medicine, and to the president of the UPMC Health Services Division. The Executive Administrator, through his or her duties and interactions with the department chair, also reports to both entities. This means that staff below the executive administrator may have job responsibilities that transcend organizational boundaries and require frequent interaction with both the university and the health system. Thus, while the department sits within the University of Pittsburgh School of Medicine, department personnel also have a direct line to UPMC health system leadership. This can lead to

complications in administration, finance, facilities management, and technology, but also arguably increases the value and potential of the department and the resources available to it. This arrangement is a necessity for the University of Pittsburgh and UPMC and has historically been shown to be successful. While there can be challenges working across the two sides of the organization, effective collaboration can result in advances for the department. The following chart details the organizational structure which the Department functions under. The Department has direct lines of reporting and authority to both the university medical school and the health system.

Department of Family Medicine

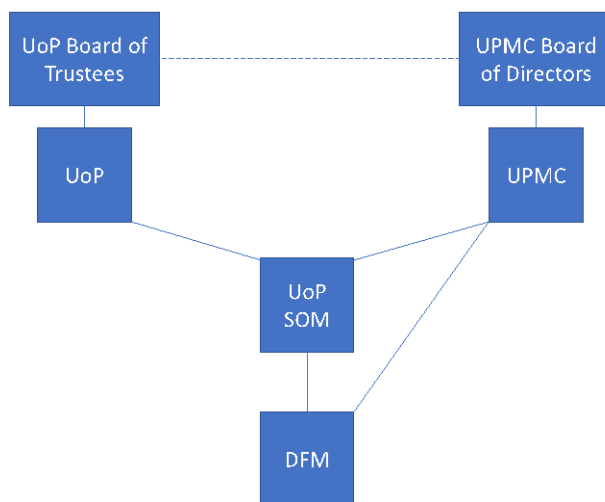


Figure 3. Reporting Structure of the Department of Family Medicine

1.4.4 Facilities Management in the Matrix Organization

Facilities are often shared between academic and clinical divisions of an AMC. It is not uncommon for academic, research, and clinical cores of the organization to all be in one urban

neighborhood with limited space available. In the case of the University of Pittsburgh and UPMC, the Oakland neighborhood of Pittsburgh houses most of the academic and facilities of the two organizations. UPMC Presbyterian Hospital, the flagship teaching and research hospital of the system, is directly connected to Scaife Hall, which houses most of the University of Pittsburgh School of Medicine. Health system physicians teach classes in the medical school building, and medical school staff have offices in the hospital. Corridors on each floor directly connect the two buildings, and metaphorically the two organizations.

This example is relatively clear-cut as compared to some other facilities arrangements between the two. An interesting example of a more fragmented situation involves the Department of Family Medicine, which is a department of both the University of Pittsburgh School of Medicine and the UPMC Health System. The Department had previously been located at St. Margaret's Hospital, a suburban Pittsburgh hospital that was acquired by UPMC in 1996. With integration into the health system, the Department moved to offices inside of Scaife Hall, the Pitt School of Medicine's headquarters. After outgrowing this space, the Department was placed in a commercial building in the same Oakland neighborhood shared by the main campuses of the university and the health system. This provides for convenient access for faculty, staff, and students, but the building in which the Department was located was inadequate and in need of major renovations. It was decided that the Department would relocate to new construction in the summer of 2016. Planning for the move was conducted by Department faculty and staff, most of whom were either directly employed for both sides of the AMC or performed work for both sides.

The core planning responsibility fell to the Department's Executive Administrator, who is jointly employed by and receives salary from both organizations. In the University of Pittsburgh

and UPMC environment, Executive Administrators are responsible for both their academic and clinical departments. Whether it be research accounting on the university side or physician workload analysis on the health system side, the Executive Administrator is the lead within each department. While it may appear that each Executive Administrator embodies the full integration of the university and the health system, this administrator must take into account the needs, priorities, policies, and culture of both organizations in order for her or him to responsibly and effectively manage joint departments such as this. Additionally, above the post of the Executive Administrator, the hierarchy splits again. The administrator is jointly responsible to the Dean of the Medical School for academic and research activities, and to UPMC Health Services Division (UPMC corporate in a broader sense) executives for clinical activities. In addition, the administrator is responsible to the Chair of the Department, who herself is faculty within the university and administrator/clinician within the health system. Thus, when planning an activity such as an office relocation, which may seem straightforward, the administrator and her or his staff must take into account applicable goals, preferences, policies, and procedures on both sides of the AMC.

Being a department of both the university and the health system can also be very beneficial in terms of pooling resources from both sides. Both the university and the health system have a responsibility and interest in keeping their employees in safe, comfortable, and efficient workspaces. If a facility is not suitable, it is in the interest of both parties to identify one that is appropriate. This means that funding and administrative support should be allocated from both sides. This increases the potential pool of resources available to the department for its activities, and expands the technical expertise that can be used for project completion. While it may be difficult to get both sides to agree on a specific plan to which they are both willing to

contribute, and while those contributions may come with stipulations that could be vetoed by one side or another, efficiency and outcomes can be improved when the two sides work together.

Once it had been decided that both the University of Pittsburgh and the UPMC Health System would contribute to relocating the Department of Family Medicine, a new location was found and the logistical tasks of planning the move began to proceed. Given the Department's dualistic nature and the matrix organization of the university and the health system, complexities began to emerge when planning the move. First and foremost were the facilities themselves. The Department's current location was in a commercial building, with the lease being handled by the University of Pittsburgh's property management office. This created a difficult situation when preparing for the move, as both the University's and UPMC's facilities management departments were prohibited from performing work in any locations not directly owned by either entity. In preparation for the move, furniture had to be deconstructed and shelving removed from the walls; normally this would be accomplished by simply putting in a work order within either the university or the health system.^{xxxvi} In this case, however, both facilities management offices were unable to assist the department with any building-related activities. The building's commercial owners were contacted, but said that the Department would have to hire an outside contractor to perform this work. Staff were left to contact various facilities-related offices in both the university and the health system in order to find someone willing to perform work in this building. Eventually, a special crew was procured by the director of the University's property management office, but this resulted in delays that pushed-back other elements of the project. What would have normally been a straightforward procedure was hampered by the Department's matrix structure.

Once that hurdle had been overcome, the needs of the information technology and telephone networks of the Department were addressed. The challenging needs and preferences of the two organizations became clear during this step. It was discovered that while the Department's computers and electronic equipment were owned and managed by the UPMC Health System, the telephones were owned and managed by the University of Pittsburgh. Both the computers and the telephones, while technically on separate networks, were fed by the same telecommunications lines, which are managed and maintained by the University.

Beyond the obvious challenges of such an arrangement, it must be noted that this produced more downstream complications for faculty and staff. For example, the computers in the office ran on a UPMC network, which meant that anyone who wanted to access the computers had to have UPMC logon credentials. This setup required that each new staff member within the Department be issued both a University of Pittsburgh and a UPMC username and email address, even if that employee only performs work for one entity and not the other. Also, since the computers were set up for UPMC email, University email addresses did not automatically populate the email client so they had to be set up manually, which caused problems for staff and technical support teams on both sides. This is an example of small incompatibilities of policies and procedures within an academic medical center having unexpected adverse effects on faculty, staff, and students.

1.4.5 Information Technology (IT) in the Matrix Organization

Both the University of Pittsburgh and UPMC have separate IT support teams. The University's support group is known as the Computing Systems and Services Development (CSSD) team, while the UPMC group is known as the Information Services Division (ISD).

These teams operate independently of each other, as they have different responsibilities and priorities. However, the practical reality is that these teams must collaborate regularly, especially in situations where personnel of both organizations occupy the same physical space. Both IT groups employ online service request forms which employees can use to request technical services. These forms are entity-specific, requiring different user IDs, sets of computer networks addresses, and device names. These unique identifiers differ from the university to the health system. The service request form for the University of Pittsburgh allows users to identify himself or herself as a member of UPMC, which eliminates some sections of the form that are not relevant to UPMC users.^{xxxvii} This presumably helps technical support personnel at the university to determine if a user requires separate resources since they are part of the health system network. There is no equivalent feature on the UPMC technical support forms, which are behind a firewall and accessible only to registered employees of the health system. This presents an important contrast in views about access to and security of information between the university and the health system. Most of the university's support request forms are publically available on the university's website, whereas UPMC support forms are only accessible via the company's internal intranet site, InfoNet, which requires valid logon credentials to access. This may be intended to enhance the security of the health system's networks, as patient privacy is vital for healthcare organizations in compliance with laws governing data access and disclosure, most notably the Health Insurance Portability and Accountability Act (HIPAA) of 1996. This focus on security may necessitate keeping health system forms behind a firewall and within the health system's restricted network.

While a matrix structure may favor having one common technical support team for both sides of the AMC, the reality is that there are considerable differences between the university and

the health system's technological needs. The University of Pittsburgh serves the technological needs of its faculty and staff by having a more open network that encourages collaboration between parties through a university-wide network. The university's IT needs are more education-based and serve a much different population than the health system. UPMC, with 20 hospitals, has a much broader network that is engineered to serve the needs of a primarily medical environment, with a focus on patient data and an Electronic Medical Record (EMR) application that requires constant maintenance and a large supporting database. To have a common IT support team would discount the unique needs and responsibilities of each organization, and would require technicians to be familiar with platforms that have very different structures and uses. In the case of an AMC, the technical activities of the university and health system component are sufficiently different that having separate IT support teams is practical.

Access to the university's and the health system's network is restricted to authenticated users. Both entities issue their own computers and electronic devices, but the process is slightly different for each. The University of Pittsburgh employs a centralized purchasing department known as PantherExpress (the panther is the mascot of the university's sporting teams), and contracts with dedicated suppliers for certain types of equipment. Computers are supplied by Apple Inc. and Dell Electronics Co., depending on which operating system an employee requires.^{xxxviii} Departments can designate access to PantherExpress, also known as the Internet Procurement System, in order to purchase devices for departmental use. According to University of Pittsburgh Policy *05-02-15: Required Use of Contracted Suppliers*, university employees are required to use this system, but can select different computer models and configurations offered by the vendor.

At UPMC, users must request a new computer from the Information Services Division (ISD), a centralized technical support group. This selection is also made online, but within the health system's password-protected intranet. The user may select between a desktop and a laptop computer, but is also limited to machines provided by a contracted supplier. In both systems, a request or purchase order for a new machine must be approved by the employee's supervisor, and in the case of the Department of Family Medicine, this would be the Executive Administrator. Fortunately, requests in both systems within the departments are reviewed by this administrator, who can sign off on purchases made through either entity.

Since the Department of Family Medicine uses the University of Pittsburgh network to connect to the Internet, access is governed by University of Pittsburgh Policy *10-02-05: Computer Access and Use*. Access is limited to "faculty, staff, and students for recognized instructional research, or administrative purposes within the University."^{xxxix} Nothing is explicitly said regarding health system access to the university's computing resources, but the policy does make allowances for:

Organizations whose use of such services is for a recognized public service. For purposes of administering this policy, such classification will apply only if the organization has been designated as federally tax-exempt under the Federal Internal Revenue Statutes and whose purpose for use of such services is approved by the University's Office of the Provost.^{xl}

UPMC, as a non-profit entity, would qualify for use of university resources under this policy. While there is a requirement that such an organization perform a "public good," it is apparent that a healthcare institution would qualify under that description. This policy likely forms the basis for sharing computing resources across the matrix of the organization.

Once it was determined on which lines the computers and telephones operated, efforts had to be coordinated between University and UPMC staff to make both systems functional at the new office location. Since the new location was primarily attracting University tenants, the University's IT team opted to run a high-speed fiber optic cable directly into the building so as to accommodate the labs and research centers that were relocating there. This created a problem for the Department in that there was no option to also run UPMC telecommunications lines into the building to connect the computers to the health system's network. Special arrangements then had to be made between the University and UPMC to virtually create a UPMC network within the building and within University data cables.^{xlii} Department staff spent considerable time trying to devise a workaround to this issue, as communication between the two separate IT groups was hesitant at first. Eventually, the problem was solved by bringing the two sides together in a conference call, and by department staff connecting each side's IT teams by email. Once connected, the two IT teams began to communicate independently without the assistance of Department staff, and the situation was resolved favorably. Initiating communication between offices and between divisions is key to bringing a project like this to a close. In a situation such as this, it is the role of the responsible managers and administrators to act as go-betweens and to initiate communication across the matrix. This is where the job of a project manager really becomes that of a "facilitator;" someone in the middle who can get all parties working together. While the matrix organizational structure can help to encourage communication across departments and across service lines, the line between the academic and clinical sides of an AMC can be difficult for staff to cross independently.

The final challenge presented during this project continues to present an obstacle: regular building access and maintenance. As with the Department's previous location, the new office sits

in a commercial building with the lease managed by the University of Pittsburgh. One problem with this arrangement is that since neither entity (University or Health System) owns the facility, neither entity's maintenance department will service the Department's office. Immediately after the Department moved in, efforts to install artwork and shelving throughout the suite were met with resistance from both sides' respective maintenance departments, with both saying that they were not allowed to service any buildings not directly owned by one of the entities. On the University's Facilities Management webpage, all university buildings are listed, along with the contact information of building coordinators. A review of this list finds that neither the Department's old office nor its new offices are listed.^{xliii} The University of Pittsburgh's 2010 Institutional Master Plan for facilities states^{xliiii}:

In addition to E&G and Auxiliary, the UPMC Health System is responsible for the management of several University or Commonwealth-owned facilities that house programs that directly support the academic and training missions of the schools of the Health Sciences, particularly the School of Medicine.

The Master Plan does not define what exactly counts as “directly support[ing] the academic and training missions of the schools of the Health Sciences...” but it has been established that the spaces housing the Department of Family Medicine do not qualify as such, at least according to the university.

A solution was found when construction personnel who were still fitting-out other suites in the building agreed to perform this work. This challenge will be ongoing, as Department personnel will have to take the time to identify qualified construction workers and maintenance personnel outside of the University and Health System environment.

1.4.6 Outcomes of Matrix Management

Situations such as this may make it seem like the matrix structure of management between the university and the health system resulted in primarily additional effort but no benefit for the Department, but this is not the case. The counterpoint to the challenges of effectively having two lines of authority is that when both key decision makers agree to move forward with something, it can be done by accessing the resources of both sides. In the case of the Department of Family Medicine, the new office suite was a considerable improvement over their old location. The facilities were outfitted to the Department's exact specifications and more office and collaboration space is available. Department morale likely improved once employees were moved to a more suitable space, which may result in more effective and efficient work being completed. Without contributions from both the University of Pittsburgh and the UPMC Health System, this upgrade would not have been possible. It is true that the matrix structure of the organization added complexity to the project overall, but nonetheless the project was successful. Both sides wanted the Department to occupy a more appropriate space, and they worked together to make it happen. In this instance, then, the overall result was definitely a net gain, and demonstrates that better outcomes can be achieved as a result of drawing upon the resources of two organizations.

This office relocation and its associated technical and management challenges are prime examples of workings within the matrix structure. Personnel in effect fulfill two or more roles within a matrix organization and are accountable to two different lines of authority. Having a matrix management structure forces employees and supervisors to think beyond department and organizational boundaries. In order to accomplish things in an academic medical center such as this, one must be prepared to work across the organizational boundary and to deal with a wide

variety of departments on both the university and health system sides of the entity. By bridging organizational divisions and pooling resources from across the matrix, the end result was a success for the Department of Family Medicine.

2.0 CONCLUSION

Academic medical centers perform many different roles, from educating the next generation of clinicians and developing best-practices through research to healing patients and improving the health of their communities. They fuel crucial innovation through their research programs, and ensure that patients are offered the most cutting-edge and effective of treatments. In order to perform these valuable and varied tasks, it is necessary for the modern academic medical center to operate each of its major components – a university and a health system – separately. The differing expertise that each side offers adds to the net value of the AMC can present challenges for efficient management of such a broad entity. Employees of one side of the organization frequently perform work for both sides, and routine tasks such as facilities management, maintenance, technical support, finance, and human resources sometimes span across the university and health system sides of the AMC. This forces faculty and staff to reconcile the competing needs and preferences of each side, all while responding to parallel and sometimes conflicting policies and procedures. However, while these challenges may decrease efficiency at the individual department or business unit level, they also add value to the organization as a whole. Matrix management allows for each individual employee to have two or more lines of supervision up through the organization, a structure that may increase operation efficiency through cross-training and by allowing employees to perform work outside of their strict organizational hierarchy. The University of Pittsburgh and the UPMC Health System are

examples of a matrix successfully put into practice. Affiliated in terms of mission, goals, and operations, they can work together to improve the state of health of the region and collaborate to drive health care innovation in a way that a non-matrix organization may not offer. These entities must be effectively integrated by leadership in order for the AMC to fulfill its complex and adapt to the challenges of an increasingly complex environment.

2.1 RECOMMENDATIONS FOR PRACTICE AND FURTHER STUDY

Examining the matrix structure within an AMC provides valuable lessons for practice and study in the field of healthcare and medical education. The different methods of interplay between universities and their affiliated health systems present advantages, disadvantages, and challenges for those who work in this field. To succeed within the matrix, faculty and staff must be versatile and must be able to adapt; doing so successfully can increase organizational efficiency and can help remove barriers to progress that come with having strict organizational divisions. Additionally, AMC faculty and staff should explore the ways that the resources of the matrix organization can benefit them and their departments. It is important to look beyond the organizational boundary when planning for the future in order to see how actions will affect each side of the AMC, and how the combined resources of the AMC can help faculty and staff achieve their goals. Further studying different models of AMC integration would help decision makers think holistically about their organizations, as would study on how medical education differs in a matrix AMC versus a non-matrix AMC.

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