Basic Primer for Finances in Academic Adult and Pediatric Pulmonary Divisions

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The finances of academic medical centers (AMCs) are complex and rapidly evolving. This financial environment can have important effects on faculty expectations, compensation, and the work environment. This article describes the commonly used concepts and models related to financial decision-making in Pulmonology and Critical Care divisions across AMCs in the United States. Faculty clinical productivity is often measured by work relative value units, which are set nationally for a discrete piece of physician work and attempt to equilibrate aspects of care across specialties. The expected clinical productivity and salary for a given faculty member are often determined relative to one or more national benchmarks developed from data submitted by departments and schools across the country. The most commonly used benchmarks include those from the Association of American Medical Colleges and the Medical Group Management Association. Changes to the paradigm of fee for service reimbursement are beginning to change physician compensation and incentive structures. In addition, research and education are key academic missions for faculty. It is important to understand the limitations of extramural research funding and implications for the support of research infrastructure. Measurements of productivity within education have been less codified, but some centers are attempting to create educational relative value units similar to those used in clinical productivity. In summary, faculty should understand basic concepts of finances. This knowledge includes a common set of terms and concepts that can help all faculty understand basic financial considerations in their work and lead to success for their divisions.

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All faculty should have a basic understanding of finances and flow of funds in academic medical centers (AMCs). The current article provides an overview of principles integral to pulmonary and critical care divisional financial success. We review current definitions and commonly used

measures of clinical, research, and education productivity. We also discuss limitations of these measures and future opportunities. The goal of this article is to serve as an introduction to key concepts and spur the readers' interest in delving further into the finances within their home institution.

ABBREVIATIONS: AAMC = Association of American Medical Colleges; AMC = academic medical center; cFTE = clinical full-time equivalent; F&A = facilities and administrative; GME = Graduate Medical Education; MGMA = Medical Group Management Association; NIH = National Institutes of Health; RVU = relative value unit

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Definitions and Benchmarks

“Funds flow” refers to the process by which monies are transferred between entities within an AMC to support the academic missions.¹ In all AMCs, clinical revenue generated by hospitals and health systems is used to support the research and teaching academic missions. Different funds flow models exist, as financial arrangements and governance structures vary across AMCs. Although it is outside the scope of this article to review the different models, it is incumbent upon each provider to understand the model used at his or her own institution.

There is a movement toward increased accountability for effort and productivity stimulated by a decrease in discretionary funds. Many AMCs are using work relative value unit (RVU) generation as an indicator of clinical productivity and a driver of physician compensation. RVUs are scaled units of care that are developed and maintained by the Centers for Medicaid & Medicare Services. RVU components include physician work RVUs (based on expertise, skill, and time required for each service), practice expense RVUs, and liability insurance RVUs (accounts for insurance premiums).² There is then a geographic cost index adjustment made based on the location of care. RVU determination for each service is primarily based on the recommendations from the American Medical Association/Specialty Society Relative Value Scale Update Committee, which consists of physicians appointed by various medical subspecialty societies to the Centers for Medicaid & Medicare Services.³ Although RVUs were established to assess relative value of various provider activities, they were not designed to measure physician performance. For this review, we focused on the physician work RVU and used the term RVU to refer to that component.

Most institutions compare RVU productivity of individual faculty vs one of the several national benchmarks of productivity. Benchmarks provided by the Medical Group Management Association (MGMA)⁴ are frequently used because MGMA has the largest database for specialty productivity and salary compensation in the United States. MGMA performs a voluntary survey of academic and private practice groups. The results may be biased as the survey relies on voluntary responses by MGMA member and nonmember groups.

Vizient is a company that owns a widely used database which includes a variety of information that can be important for AMCs.⁵ Included in this database is VHA

Inc., a national health-care network of not-for-profit hospitals; University Health System Consortium, an alliance of AMCs; Novation, a health-care contracting company; and MedAssets’ Spend and Clinical Resource Management segment. Vizient and the Association of American Medical Colleges (AAMC) just launched Clinical Practice Solutions Center, which replaced the Faculty Practice Solution Center.⁶ The expanded Clinical Practice Solutions Center platform now includes community-based physician practices as well as academic practices. In aggregate, the databases include information from > 90% of the nonprofit AMCs in the United States.

In addition, many specialty societies maintain a database of RVU benchmarks. For example, the Association of Administrators in Academic Pediatrics has a more robust sample of pediatric subspecialties and associated RVU benchmarks. In other areas, such as lung transplant, development of custom benchmarks is required. Finally, the American Medical Group Association also performs an annual survey of practice groups⁷ and is weighted toward large, multispecialty group practices.

The benefits of using RVU productivity include that it is independent of payer mix, collection issues, and charge lags. Specialty-specific benchmarks allow one to compare productivity within each specialty. However, when payouts are determined by using RVU productivity rather than revenue generation, providers may not receive their full compensation or incentives even when they meet their RVU goals if the institution is struggling financially. A significant change in payer mix may limit the money available for compensation. In addition, benchmarks based on RVU productivity do not take into account value-based care or quality improvement and could encourage unnecessary tests, visits, and procedures that increase RVU production. RVU benchmarks generally do not account for time in rank. For example, a new assistant professor who just completed his or her fellowship may be expected to generate the same RVUs in clinic as someone with 20 years’ experience.

Several benchmarks are used for physician compensation. Many centers use the AAMC compensation benchmarks.⁸ AAMC represents all accredited US and Canadian medical schools; approximately 400 major teaching hospitals and health systems, including Department of Veterans Affairs medical centers; and 90 academic and scientific societies.

Total compensation data are provided according to department/specialty, degree, rank, school ownership, and region. One potential limitation of regional compensation data is lack of sufficient sample size. Thus, many institutions choose to use national benchmarks.

As noted for the RVU productivity benchmarks, specialty societies often maintain databases of salary benchmarks, which may have more robust data than AAMC, particularly for subspecialties that are not captured in the AAMC database.

Additional limitations of databases for both salary and productivity benchmarks include variability of sample size. Median values are generally preferred over mean, as median values are less affected by outliers, absence of data in some subspecialties (especially smaller programs), and differences in practice types. Finally, understanding how and from where data are collected for each benchmark is important to understand the limitation of each database.

Flow of Finances With AMCs

The flow of money into and around AMCs can be complex. Revenue in AMCs generally include hospital charges and federal support for residency training programs to hospitals. Faculty practices and physician practice groups acquire revenue from professional billing and often by funds transferred by hospital revenue. Finally, schools of medicine and academic employers may acquire revenue from tuition charged to students, transfers from hospital revenue, and taxes on the professional billing by physicians. Each institution has a unique flow of revenue and support based on a variety of local factors.

Clinical Care

As discussed earlier, physician clinical productivity is primarily measured by using RVUs. Other measures of productivity may include revenue, number of outpatient sessions, number of inpatient rotations, or clinic volume. Because RVUs are payer agnostic, many clinicians and AMCs use this metric. Productivity targets can vary across institutions. For example, a physician may be expected to reach the 65th percentile of RVU productivity to meet expectations for his or her full compensation. Incentives may be provided for exceeding RVU expectations, achievement of specific quality metrics, or based on Hospital Consumer Assessment of Healthcare Providers and Systems⁹ or Clinician and Group Consumer Assessment of Healthcare Providers and Systems¹⁰ scores. This organization provides

standardized survey tools that measure patients' perception of care by physicians in the hospital or clinic setting.

There are several challenges to using RVUs as a measure of productivity. The complexity of the patient encounter may not be fully captured. For some encounters, optimized billing occurs by using time-based documentation (eg, a relatively "simple" seeming patient who required a long visit), whereas at other times using other documentation might optimize coding (eg, a relatively complex patient who had a brief but comprehensive visit). Patient visits for those with chronic illnesses such as cystic fibrosis or interstitial fibrosis are time- and resource-intensive; however, RVU productivity is often not reflective of the complexity of these return visits. Other strategies, such as system support, may be necessary to adequately reward these physicians such as a "back stop" from the health-care system.

In some settings, coverage models may supplement RVU productivity. Many medical, pediatric, and NICUs in AMCs have a "closed unit" structure in which ICU attending coverage is required independent of patient census or acuity. Furthermore, hospitals are increasingly adopting 24-h in-house ICU attending coverage.^{11,12} Telemedicine ICU coverage is also utilized in some settings. Providers are generally paid per shift. Because RVUs are not generated by telemedicine ICU coverage, hospitals must financially support this activity. Nocturnists or nighttime intensivists require support from the health-care system because RVU generation is not sufficient to support the salaries of these providers. However, hospitals may reap benefits from other outcomes, such as decreased length of ICU stay, decreased hospital stay, decreased testing, or decreased procedural intervention, which result in cost avoidance for patient care.¹²

To justify financial support from the health-care system for programs that are not self-sufficient, it is critical to document the value added for the health-care system, such as downstream revenue generation (eg, infusion revenue), decreased readmissions, decreased length of stay, or improved quality metrics, and to ensure that the goals of the clinical program align with the strategic goals of the health-care system.¹³

One dramatic change occurring in health care is a shift from encounter-based or fee-for-service structures to reimbursement based on the value of care provided.¹⁴ This value-based approach represents a paradigm shift

in clinical care models of productivity and reimbursement. In this paradigm, value is often defined as the quality or outcomes of care relative to the expense of care. Value increases if quality and outcomes improve or if expenses decrease or, ideally, when both occur simultaneously. When health-care system reimbursement is tied to value-based care, individual physician incentives should also be aligned to value-based care. For example, physicians may be rewarded for the size of their panel of patients and measured clinical outcomes but not incentivized to individual visits or RVU generation.

At AMCs, faculty spend time in clinical work but also other academic pursuits such as teaching and research. Therefore, most AMCs use the clinical full-time equivalent (cFTE) of faculty members to determine clinical productivity. However, there is no uniform agreement about what constitutes a cFTE. For example, cFTE may be based on a defined number of outpatient clinics, procedures, and/or inpatient service times or a default based on percent salary that is not funded by other missions (eg, research, education). In general, faculty with other sources of salary (eg, grant funding, course directorship, administrative roles) should have proportionately less clinical work. In pediatric and adult pulmonology, there are no accepted standards for a cFTE, and it may be determined by the institution or department.^{15,16}

When determining cFTE, a faculty member may have funded or unfunded protected time for research or education. Program directors, fellowship directors, and those who direct medical student teaching often receive FTE support to lead these activities. Medical directorships or contracted clinical work (eg, telemedicine ICU shifts, stipends for outreach clinics, VA eighthths) are other forms of salary sources for some physicians. A challenge in the current financial environment is supporting time for unfunded activities. There is intense scrutiny on these activities and an expectation of increased accountability for time spent away from revenue-generating clinical care. When calculating cFTE, all these activities are included in the final calculation (Table 1).

Research

Research is one of the pillars of academic medicine, enabling us to improve the health of our communities through discovery and innovation. Since the creation of the National Institutes of Health (NIH) funding model

TABLE 1] cFTE Calculation

Dr Sue Damonas salary sources include:
• 20% effort on an NIH grant
• 10% effort as Respiratory Therapy medical director
• 15% effort as medical school course director
Therefore, her cFTE is 55%

cFTE = clinical full-time equivalent; NIH = National Institutes of Health.

following World War II, federal funding has supported the majority of basic discovery research.

Research grant awards include direct costs and indirect costs. The NIH defines direct costs as “any cost that can be specifically identified with a particular project, program, or activity or that can be directly assigned to such activities relatively easily and with a high degree of accuracy.”¹⁷ Direct costs include, but are not limited to, salaries, travel, equipment, and supplies directly related to grant-supported projects or activities. In addition, institutions incur costs that are difficult to attribute to specific projects, such as building depreciation, utilities, maintenance and administrative expenses (including regulatory and compliance offices). Referred to as facilities and administrative (F&A) costs, indirect costs, or overhead, these represent true costs that the institution incurs to support research activities. Each institution negotiates its own F&A costs with the federal government. However, F&A costs are insufficient to fully support the costs of research infrastructure. The AAMC recently reported that the average medical school investment was an additional \$0.53 for each dollar of sponsored research received.¹⁸ Thus, institutions must subsidize the costs of research with other revenue sources. In the past several years, federal funding for research has not grown as fast as the research being conducted. Due to this differential growth, private industry and foundations have now become the funders for the majority of discovery research in the United States.¹⁹ However, the F&A rates for private funding sources are often less than federally negotiated rates, which increases the institutional burden of cost-share for research. The vast majority of funds for cost-share derive from clinical revenue.

Most federal grants, including NIH grants, allow faculty to include the cost of faculty time needed to complete the research in the budget. However, there is a limit to the direct salary (NIH salary cap) that an investigator may receive from a NIH grant.²⁰ The salary cap is applied to the faculty’s base pay, exclusive of fringe

benefits. However, the NIH does not limit or dictate an individual's institutional salary. Therefore, if an individual's base salary exceeds the NIH salary cap (currently \$192,300 per year), there will be a "gap" between the amount charged to the grant and the actual salary (Table 2). How the gap is made up depends on the institution. In some cases, it is the responsibility of the division to fund the gap by using nonfederal funds, generally done with clinical revenue or endowments. Institutions may have state-allocated research funding that is allocated to the salary gap. Thus, the salary gap represents another research expense that is covered by the institution.

Education

Education has long been an underfunded mandate in AMCs. With increasing focus on accountability for effort, time for teaching and education is threatened. However, educating our future pipeline of clinicians, physician scientists, and academicians is critical for our profession but most importantly for our patients. Several models have been proposed to document the work done or productivity in the education mission. Some AMCs have instituted "educational RVUs," which credit time for teaching. These educational RVUs are used to track time spent teaching, either informally or formally. For example, one may receive credit for giving a formal lecture, precepting a fellows clinic, or teaching students on the inpatient ward service. A limitation for these educational RVUs is the amount of effort needed to accurately track time spent in the education mission, and unlike work RVUs, they are not strongly associated with an activity that is reimbursed externally. For medical student education, some public institutions allocate state funds directly proportionate to hours spent teaching medical students, which can be used to "buy-down" efforts or to support course directors. For resident teaching, Graduate Medical Education (GME) monies may be used.

TABLE 2] NIH Salary Cap Impact

Dr AI Veoli institutional base salary is \$250,000/y
• 20% effort on an NIH grant
• 20% of \$250,000 salary is \$50,000
• 20% of the NIH cap (\$192,300) is \$38,460
• Institutional/departmental cost share is \$11,540
• Faculty effort certification
• Dr Veoli is still required to spend 20% of his time on research

See Table 1 legend for expansion of abbreviation.

An additional challenge for the education mission is identifying adequate support for fellowship training programs, including salary support for fellows, for fellowship program directors, and for program coordinators.²¹ The *Accreditation Council for Graduate Medical Education* mandates that fellowship program directors receive funding for this role, and the amount of monies allocated for this mission-critical activity varies across institutions and specialties. Salaries for pulmonary fellows may not be completely funded through GME funds. Furthermore, GME funds may not always cover salaries for research activities. Therefore, alternate sources of funding, such as grant support, philanthropy, or clinical revenue, are often necessary to support fellows.

Conclusions

It is critical for all faculty to have a basic understanding of the finances of AMCs, particularly because the margin from clinical revenue is a major source of revenue support for the education and research missions. Although each AMC may differ in some specifics, it is incumbent upon individuals to understand how their salary is generated, how to optimize productivity, and how the different missions are supported.

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