Title

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Supporting Pediatric Education through Aligned Funds Flow

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Longstanding threats to education in academic medical centers (AMC) have been exacerbated by the coronavirus disease 2019 (COVID-19) pandemic. Decreased departmental revenue, cessation of in-person learning, and reduced morale have disrupted medical education at both the undergraduate and graduate levels. Educational efforts have traditionally suffered from a lack of dedicated sources of funding, leading to a crisis among educators, and causing them to abandon this field to pursue nonacademic clinical careers.[1] Physician-educator's well-being, engagement, and job satisfaction are critical to their functioning as strong role models for students, residents, and fellows.

Several threats to the education mission have emerged during the pandemic, as recently outlined by the American Medical Association.[1] The loss of in-person learning experiences, a crucial aspect of medical student and resident education, has disrupted the clinical learning environment. Strained, overextended, and undersupported physicians struggle to meet increased service demands. For example, the increased use of residents to cover for sick colleagues during COVID-19 surges added to the baseline stress of constant exposure to patients with COVID-19. Redesigning educational programs to incorporate virtual platforms has been effective in some circumstances, providing flexibility to educators and students, but at the cost of human interaction, leading to mental stress.[2] Disruptions to classroom, daycare, and home activities have burdened young educators, especially mothers. Educators have had to navigate steep learning curves to adapt to virtual platform-based teaching.

Vicious Cycle of Stress in Medical Education

Physician-educators, overburdened by clinical work and lacking adequate time for teaching, experience stress and poor engagement (**Figure 1**, A). They fail to prioritize learner education and cannot function as good role models. Poor education leads to poor learner performance, dissatisfaction, and low evaluation ratings of the learning experience by trainees. Impaired learner performance and poor evaluations exacerbate physician-educator's stress, leading to further disengagement. The final outcome of this vicious cycle of stress is the retreat of physicians from the educational mission and a loss of educational leaders.

We hypothesize that such a vicious cycle leading to educator burnout can be broken through valuing educators by incentivizing their efforts and providing adequate protected time and support. Organizational recognition of the importance of education and assignment of resources to educator well-being and career development should result in enhanced positive interactions and engagement between educators and learners. An aligned funds-flow process has the potential to create such a positive environment.[3-6] Some prior efforts, as part of a wider mission-based budgeting system, included the creation of an educational value unit as a first step in quantifying educational efforts and placing such efforts on par with the work relative value unit assigned to clinical efforts.[7] Although the concept of the educational value unit is inherently attractive and directs attention toward the educational mission of an academic unit, on a practical level there is huge variation in how the metric is designed, implemented, and used by health systems to allocate or redistribute funds. Data tracking is complex and burdensome, and there is very limited information about the objective outcomes of such efforts.[8] Supporting teaching time with aligned funds flow by the AMC seems to be a better alternative, especially because a funds-flow process involves an overhaul of funding of each of the health system's missions, allowing mission-based allocation of funds in a more facile and flexible manner. The goal of our article is to outline challenges to various aspects of the educational mission in our AMC, the implementation of an aligned funds-flow model, and its effect on teaching efforts and quality.

AAMC	Association of American Medical Colleges
ACGME	Accreditation Council for Graduate Medical Education
AMC	Academic medical centers
COVID-19	Coronavirus disease 2019
FTE	Full-time equivalent
GME	Graduate medical education
GQ	Graduate questionnaire
UME	Undergraduate medical education

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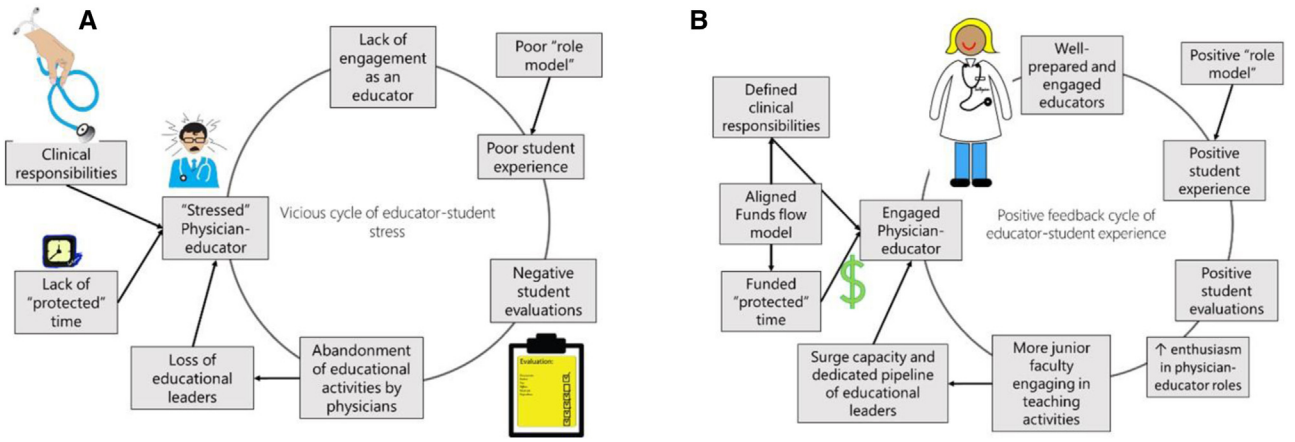

Figure 1. **A,** The vicious cycle of stress in an inadequately supported medical education system. Increased clinical work and lack of protected time leads to physician stress and lack of engagement in teaching, resulting in a poor student experience and poor evaluations of the educational experience. This negative feedback leads to abandonment of educational activities by physicians and eventual loss of educational leaders. **B,** Breaking the vicious cycle of physician-educator and student stress; aligned funds flow providing adequate protected time for teaching activities and defining clinical responsibilities.

Financial Challenges Faced by Undergraduate Medical Education in Pediatrics

AMCs are facing multiple challenges with respect to medical school finances (Table I) Unique challenges in pediatrics include (i) limited direct support for mentoring learners interested in pediatrics; limited support for fourth-year education or educational director to oversee the experience for fourth-year students interested in or committed to a career in pediatrics; (ii) small relative size of most pediatrics departments, compared with internal medicine, such that faculty do not have leeway to engage in robust teaching or take on educational leadership roles in pre-clerkship courses, making pediatrics an orphan subject in the early curriculum; (iii) increasing accreditation and educational quality improvement requirements with little support for these critical efforts; and (iv) decreased census in children's hospitals during the COVID-19 pandemic, leading to less departmental revenue and fewer student learning opportunities, especially as related to common pediatric infectious conditions.[10]

Table I. Challenges faced by AMCs specific to the educational mission

Increasing medical schools class sizes
Specialized medical school pathways with differing structures (eg, tracks focusing on primary care, research, rural service)
Limited site/preceptor availability
Support for educational innovation and curriculum development/renewal
Financial resources for educational scholarship
Lack of direct and transparent funding for front-line teaching activity by faculty educators (including community preceptors, on whom there is increasing reliance)
Insufficient financial support of clerkship directors (based on national published guidelines)[9]
Insufficient administrative support for clerkship directors[9]

Financial Challenges Faced by Graduate Medical Education

The graduate medical education (GME) enterprise has been supported more transparently than undergraduate medical education (UME) through federal and state funds, as well as support from the AMC (derived from a combination of philanthropy, grant funding, and clinical work). However, funds to supplement GME teaching efforts have not always been allocated systematically among various departments. Moreover, although the Accreditation Council for Graduate Medical Education (ACGME) has defined minimum requirements for administrative time commitments for program directors and program coordinators for residency and fellowship programs based on the number of residents, and fellows, this funding has in the past been the responsibility of individual departments. During interviewing and on-boarding periods, residency and fellowship programs need additional resources. Recent proposed changes to pediatrics residency by ACGME are likely to require additional inpatient resources contributing to additional costs for the departments and AMCs (https://www.acgme.org/globalassets/pfassets/reviewandcomment/320_pediatrics_impact-022023.pdf).

Aligned Funds Flow Adopted at UC Davis Health

A change in the funds-flow model provides an opportunity to refine educational support and assign protected time to educators for training and career development, to enhance delivery of educational content, to support mentorship of learners,

and to facilitate educational scholarship (Table II). Input solicited from medical students and residents to foster an environment of shared learning can help to redesign workflows that support the educational mission of the school of medicine. UC Davis Health in 2020-2021 implemented an aligned funds-flow methodology that provided adequate funding to support the administrative tasks of medical educators and residency directors and fund core administrative staff (eg, residency program coordinators).[3]

Elements of the Model Pertaining to Undergraduate Education

To streamline the process of funding UME, the following principles were established through active discussion with the education team. (i) Any activity requiring <5% effort was considered part of the regular, low-intensity, and expected teaching activity of a faculty member and would not be supported by discrete funding. (ii) Efforts of ≥5% would be funded through support agreements.

(i) Various clinical roles were identified (eg, clerkship directors, small group facilitators) and the percentage effort for these roles was determined.
(ii) Benefits for the portion of full-time equivalent (FTE) relating to UME effort provided by clinical faculty were covered through a payment to the department by the dean's office.

Defined Roles

Funding was provided to departments for defined, high-intensity teaching roles within UME based on the time-based effort required for the role. These defined roles were standardized to support the time spent away from clinical, work relative value unit-generating activity. The percent effort for defined positions was set by the Vice Dean of Medical Education with the approval of the Dean. The amount of support was calculated by multiplying the percentage of effort required for role with the Association of American Medical Colleges (AAMC) compensation benchmark salary. The faculty member's actual rank and specialty was considered during this calculation.

Required Clerkship Support

Eight departments in the UC Davis School of Medicine (emergency medicine, family medicine, internal medicine, neurology, obstetrics and gynecology, pediatrics, psychiatry, and surgery) offer required clerkship courses to medical students. Department chairs need discretionary funds available to recognize and compensate faculty in key teaching roles (faculty often take these roles at the potential expense of their own individual productivity). Departments with required third- and fourth-year clerkship courses must provide medical students with clinical learning experiences in a positive learning environment. A flat amount of $100 000 is provided to each department with a required clerkship/course to support their capacity to fund dedicated faculty time for teaching and supervision in the clinical setting, as well as support for key clinical educational initiatives identified annually by the Office of Medical Education, such as enhancing the learning environment, site capacity development, and faculty development in teaching.

Clinical Selective and Elective Enrollment Support

These resources provide additional funding to the departments that offer clinical electives to medical students that meet graduation requirements. The amount of support was based on prior year clinical elective enrollment (number of weeks per course multiplied by the number of students who completed the course).

Departmental Faculty Feedback Coaches

In 2019, a strategic action plan was developed in response to low AAMC graduate questionnaire (GQ) scores in the department of pediatrics. Faculty on service were busy, leading to low scores for teaching by faculty (Figure 2). In addition, direct observation of students during periods of history taking and examination and student perceptions of effective teaching during the clerkship were important areas of deficiency. To address these issues, the department of pediatrics funded faculty in the role of faculty feedback coaches. These senior faculty members meet with faculty, residents, and students on the pediatric inpatient units; perform direct observation of teaching rounds; and provide feedback to team members (students, residents, faculty). With aligned funds flow (Table III), this cost was covered and was no longer a burden on the department. Pediatric AAMC GQ scores improved with the implementation of the faculty feedback coach action plan (Figure 2).

Elements of the Model Pertaining to GME

Residency Program Directors

The faculty effort for the residency program directors is supported by the funds-flow process. All residency program

Table II. Financial investment into education (UC Davis model)

Role	Before institution of aligned funds flow	Year 1 of aligned funds flow	Year 2 of aligned funds flow
UME – SOM	$2 439 640	$7 762 491	$10 989 013
UME - Department of Pediatrics	$149 313	$914 969	$1 160 945
GME – SOM	$1 917 693	$8 515 776	$9 934 455
GME- Department of Pediatrics	$145 956	$675 517	$616 332
Total educational support at SOM (UME + GME)	$4 357 333	$16,278 267	$20 923 468

SOM, school of medicine.

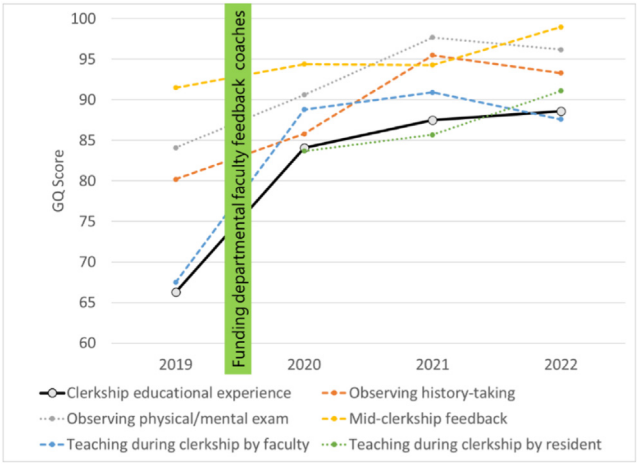

Figure 2. AAMC GQ scores in the Department of Pediatrics at UC Davis School of Medicine from 2019 to 2022.

directors of ACGME-accredited programs are supported for the dedicated time required by the ACGME (often based on the number of trainees). For ACGME programs without a specified minimum FTE required for the program director, a default of 0.1 FTE was assigned. The funds transferred to the department were calculated by multiplying the ACGME FTE requirement with an AAMC compensation benchmark set at the actual rank and specialty of the faculty member in the position.

Residency Program Coordinators

The percentage of dedicated time for residency program coordinators required by the ACGME is supported. For ACGME programs without a specified minimum FTE required for the program coordinator, a default of 0.25 FTE was assigned to the program. The cost of benefits for these program coordinators is also covered.

Fellowship Program Directors and Coordinators

Because fellows contribute to clinical workflow and revenue, only 50% of the time required by the ACGME for fellowship program directors is supported. Non-ACGME fellowship program directors and coordinators are not supported by the funds-flow process and are funded by the departments, and such fellowships in our health system only have 1-2 fellows.

Residents and ACGME-Approved Fellows

The aligned funds-flow methodology centralized the expense of all ACGME residents and fellows, so that they are no longer the responsibility of individual departments. All salary and benefit expenses for ACGME residents and fellows that are not already covered by an outside contract are funded by the health system.

Consequences of Financing UME and GME through Funds Flow

Because of the very recent implementation of the funds flow process at our institution, data on the impact of changes in educational support on outcomes are limited (Figure 1, B). Nevertheless, this realignment of support to better match educational effort has resulted in several discernable favorable changes in meeting the educational missions of the department.

Greater financial support for clerkship directors and support for some frontline faculty educational efforts have led to improved learner satisfaction (as evidenced by student evaluations and the AAMC GQ scores on the pediatrics experience) (Figure 2). The percentiles for quality of pediatric clerkship ratings in Mission Management Tool steadily increased over the years (Figure 3). Faculty are able to be more focused and engaged in teaching and can, in turn, be held accountable for their teaching activities. Support of the departmental faculty feedback coaching program has enabled faculty time to be bought out and protected. Coaches have been instrumental in providing performance feedback to third-year medical students and to pediatrics residents and faculty on their teaching efforts and in creating a safe learning environment. This practice has resulted in improved ratings of the pediatrics clerkship experience (student end-of-clerkship evaluations) and helped to meet Liaison Committee on Medical Education requirements for provision of feedback to all students.

Support of a faculty specialty advisor for fourth-year students has helped both with career advising efforts and to ensure that students interested in pediatrics continue to match into their desired residency programs, despite the increasing competition for residency positions.

The restructuring of the entire medical school curriculum that occurred in parallel with the funds-flow process resulted in the creation of new courses, which required the recruitment of new course directors. A formal and structured application process was developed with clear expectations (including the time commitment) for the course director role, transparent funding, and approval by the department chair. Consequently, courses that had been taught and led predominantly by internists traditionally (based on historical precedent) were now open to pediatric educators with interest and expertise in teaching pedagogies. In addition, a pediatric discipline leader position was created. A Stages of Life curriculum thread was implemented to integrate child health and lifecycle medicine issues in a seamless manner throughout the curriculum. With the new curriculum format, many course, discipline, and thread leader positions have been awarded to pediatrics faculty, supporting faculty in their passions. A natural and direct consequence of this change has been the early and consistent exposure of medical students to pediatrics content and pediatrician role models. We anticipate that this strategy will translate into better

Table III. Defined roles in UME and percent effort assigned (using department of Pediatrics as an example)

Role (No. of faculty)	Percent effort
Academic coach (2)	20% each
Mentoring of students, teaching clinical skills	
Clerkship director (2)	15% each (+10% departmental support for each)
Medical student professionalism director (1)	20%
Competency council	20% (chair)
Ongoing assessment of students throughout curriculum	5% (member ×2)
Clinical skills and assessment director (1)	30%
Course director (4)	5% each
For example, preclerkship courses, clerkship intersession course	
Curriculum Implementation Team chair (1)	40%
Curriculum committee and curriculum implementation task force	
Transition to residency course director (1)	10%
Discipline leader (2)	5%-15% each (total – 35%)
Integrated curriculum content leaders: bioethics, clinical skills, health system science, nephrology, pediatrics	
Problem-based learning small group facilitator for preclinical courses (3)	20% each
Thread leader (2)	10% each
Curricular content champions (eg, care for vulnerable populations)	
Departmental clerkship support	$100 000 (mainly for departmental faculty feedback coaches to observe teaching and provide feedback to educational teams on in-patient services and to provide additional time/financial support to clerkship directors (eg, conference attendance, membership dues)
Fourth-year specialty advisor/educational director (1)	10%
Quality improvement director (1)	10%
Summary	
Total FTE needed to support a class of 140 students in pediatrics	4.0 FTE (support to the department for fiscal 2022-2023): $1 160 945)

student performance when they enter the third-year pediatric clerkship and potentially increase the number of students who choose pediatrics as a career.

Ongoing Challenges and Solutions

Improved, but ongoing suboptimal, funding support for clerkship directors, based on published guidelines; additional funding provided to the departments has increased support for clerkship directors (Table I), increasing complexity of the UME educational enterprise (ever increasing class sizes, a push toward more individualized pathways for learners with different needs). As this complexity continues to increase, faculty time support will need to be adjusted upward at a commensurate rate to prevent burnout.

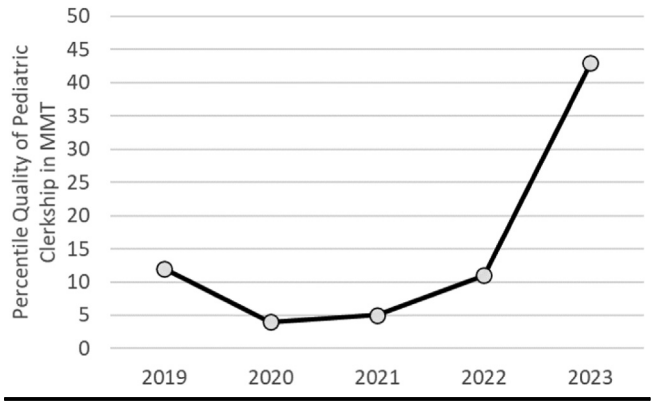

Figure 3. AAMC Mission Management Tool (MMT) – quality of pediatric clerkship–changes at UC Davis School of Medicine from 2019 to 2023.

The funding of faculty effort based on the median benchmark, not actual salaries, may discourage more senior and/or higher paid subspecialist educators from taking on these educational leadership positions. This factor may affect educational outcomes, if participation decisions are made based on salary shortfalls as opposed to interest and expertise in education. Current profit margins under aligned funds flow have enabled chairs to have adequate departmental funds to support senior subspecialists to actively engage in medical education. However, sustainability of increased funds flow to education at AMCs is being challenged by tight budgets, with decreasing federal funding for research and increasing competition in the clinical marketplace.

Conclusions

Funds flow provides a useful model for supporting clinical faculty educators and is tied to significant improvements in education outcome metrics. Whether these positive changes will be sustained, and expectations of other favorable hypothesized outcomes realized, remains to be seen. Recent proposed changes to Pediatric residency by ACGME are likely to require additional inpatient resources to staff ICUs contributing to additional costs to AMCs (https://www.acgme.org/globalassets/pfassets/reviewandcomment/320_pediatrics_impact-022023.pdf). The ability of the AMCs to sustain additional expenses to support education in an environment of diminishing clinical margins will be a challenge. Given the financial circumstances of lower margins across all

AMC's reported in 2022, and expectations that those conditions will not get better in the near future, organizations' ability to further finance expanded funds-flow models may be diminished for the foreseeable future.[11] Ongoing evaluation of GQ scores, faculty and resident/fellow wellness, and trainee and faculty teaching evaluations will help us to assess the long-term impact of this additional funding. ■

Declaration of Competing Interest

The authors declare no conflicts of interest.

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