Scholarship in Academic Surgery: History, Challenges, and Ideas for the Future

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Abstract

The role of academic surgery is changing. Traditional roles of the triple threat researcher, clinician and teacher, were formulated by Osler and improved upon by Boyle in the 1990s. These include application and integration of research to clinical problems. However, new pressures exist on the academic surgeon. Financial pressures rising costs of health care and decreased research funding all need to be addressed. In addition, retention and advancement of faculty is more difficult with increased emphasis of clinical practice in academic medicine. The future of academic medicine will require personal optimization as a multifaceted academician, businessman, and administrator, as well as rethinking how academic medicine may function in the future.

Keywords

- academic surgery
- domains of scholarship
- academics
- surgical faculty

Objectives: Upon completion of this article, the reader will have an understanding of the history and challenges of academic surgery.

To be an academic surgeon has always been difficult and as such has been the path less traveled. However, it has never been more challenging than in the current health care climate. Those who have chosen to pursue a career in academic surgery were often inspired by mentors who are true “triple threats.” These were surgeons who advanced their field of practice with innovation, and true master clinicians who touched mentees with their teaching prowess and patients with their clinical acumen. Today, academic surgeons face new challenges and require different skills than were used in the past: running financially viable departments, reaching funding goals, administering complex divisions. The path of the academic surgery is rapidly changing. We will review the history of scholarship, the current pressures on academic surgery, and conclude with ideas of how academic surgeons might change and flourish in the future.

History of Scholarship in Academic Medicine

Some of the greatest contributions to scholarship in academic surgery have come from nonsurgeons. The modern idea of

scholarship in medicine has grown from the work and contributions of Sir William Osler. A legendary figure in modern medicine, Osler was an internist by training. He joined the staff of Johns Hopkins Hospital in 1889 as physician in chief and molded many of the basic tenets of modern medicine.¹ He created the modern concept of a triple threat in medicine: researcher, clinician, and teacher.² Osler was a gifted clinician, who expanded both quantity and quality of service at the hospital during his tenure and was a prolific author.³ Perhaps his most important contribution and closest to his heart was his clinical teaching. Osler is credited for moving the medical student out of the lecture hall and into the clinics, creating the modern day “residency.” In fact, Osler’s stated, “I desire no other epitaph ... than the statement that I taught medical students in the wards, as I regard this as by far the most useful and important work I have been called upon to do.”⁴

Over the next 100 years, academic surgeons flourished in Osler’s paradigm. Leaders of academic surgery, such as Michael DeBakey, Thomas Starzl, and Edward Churchill, were expected to be at the bench and the bedside, further their field scientifically, teach students, and be clinically savvy. Success in this model is demonstrated by the awarding of Nobel Prizes in Physiology or Medicine to 10 trained surgeons (Emil Theodor Kocher, Allvar Gullstrand, Alexis Carrel, Robert

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A. Barany, Frederick G. Banting, Alexander Fleming, Walter R. Hess, Werner T.O. Forssmann, Charles B. Huggins, Joseph E. Murray), all true surgeon-scientists in academic medicine.⁵

In 1990, the concept of scholarship was altered again with Ernest L. Boyer's landmark paper "Scholarship Revisited."⁶ Boyer, the head of Carnegie Foundation for Education and a nonphysician, described four new domains of scholarship and planted the seed for modern translational research. Boyer's four domains—discovery, integration, application, and teaching—continue to dominate discussion of scholarship in academics today.

Discovery is self-evident and clear: it is "the commitment to knowledge for its own sake, to freedom of inquiry and to following, in a disciplined fashion, an investigation wherever it may lead."⁶ Discovery is true basic science unencumbered by clinical application. Integration searches for greater meaning from basic research, making connections across disciplines and integrating information into a larger context. Application is concerned with the consequences of discovery and how discovery can be useful on an individual level. Finally, teaching involves not only sharing knowledge but also encouraging students to "be critical creative thinkers, with the capacity and knowledge to go on learning"⁶ beyond what is taught by the master.

Boyer's work formed the basis for new Accreditation Council for Graduate Medical Education (ACGME) guidelines for scholarly work in all approved residency programs.⁷ Residents are encouraged to contribute work in the "Scholarship of discovery, dissemination and application."⁸ In addition, Boyer's work formed the basis for a new form of evaluation of all academic scholars. Rather than judge scholarship in each domain separately, academic institutions were urged to encourage integration between domains, application of research to clinical practice, clinical questions to research allowing each to grow, and metamorphosize through the interactions.⁹ Boyer challenged institutions to rethink standard evaluations; scholars should not be judged purely on the number of papers, hours of teaching, or clinical work load, but rather their ability to combine all three and advance their chosen field.

Current Challenges to Scholarship in Academic Surgery

Perhaps at no time in history, has academic surgery faced the challenges that are currently looming in the face of limited research funding, shrinking medical reimbursements, and increasing medical costs. Although the domains of scholarship and evaluation of scholarship are based on Boyer's model, success as a leader in academic surgery today requires a new set of talents. Financial viability of large academic departments, funding opportunities for research, and faculty retention and promotion are all issues facing academic departments, and are tasks that many traditional "triple threats" are not prepared to face.

Financial Viability of Departments of Surgery

The current economic climate has placed significant pressure on all of health care including academics. Economic crisis,

budget cuts, health care reform, the Affordable Care Act, and rising costs of health care shape all hospital finances, whether private or academic. Academic hospitals, once dependent on state and national funding for research dollars and teaching reimbursement, must now become financially independent and sustainable.

Given these pressures, academic institutions require new skills in leadership positions. Chiefs of surgery, once hired for National Institute of Health (NIH) funding and academic largess, are now required to trim budgets, balance bottom lines, and improve clinical performance. No longer are they judged on clinical, research, and teaching roles, but rather the financial viability of their department.

A 2000 study evaluated allocation of chairmen's time in leading academic departments.¹⁰ Chairmen were asked to quantify time spent in research, teaching, patient care, and administration. Fifty-nine percent of respondent's time was spent in administration: 12% in research, 16% in teaching, and 11% in patient care. Only 46% were still active in all three traditional scholarship roles: research, teaching, and clinical care. Ninety-six percent of chairmen who no longer performed research said that administrative responsibilities so curtailed research time that they felt unable to continue research endeavors.

Chiefs are often chosen because they are the best managers and administrators in the departments. In fact, many academic scholars are choosing a nontraditional career path, seeking to obtain further education in business administration, statistics, and public policy as a method of advancement. David Skylar, editor of *Academic Medicine*, notes that "when I became a physician, one aspect of medical practice I resisted was learning about the financing and payment systems of health care. I wanted my relationships with patients to be free of financial incentives that might affect my judgment and I assumed that through my ignorance of the system I could protect myself and my patients from undue financial influences."¹¹ He proceeds to describe his learning process as a Robert Wood Johnson Health Policy Fellow, a process that required 12 months away from his clinical and teaching responsibilities. After learning more about health care economics, he concludes, "who (is) better qualified than academic physicians to create the vision of our nation's future health care delivery system, the payment system that will support it, and the roles of our future clinicians, researchers and educators."¹¹

Financial Viability of Research

As departments are pressed to be financially viable, the cost of traditional research has become an issue. Funding lines on research has declined dramatically. Between 2000 and 2007, there was a 46% decline in R01 grants.¹² Between 2010 and 2013, an additional 10% was eliminated, and current budget forecasts are estimating another 7.6% reduction by 2017. This translates to an annual loss of 700 to 2000 grant opportunities.^{13,14} The time and research needed to obtain R01 funding has also changed; while the average age of an R01 lead investigator in 1980 was 37 years of age, by 2010 it had climbed to 45.¹ Even those who obtain federal funding may

not achieve financial viability for their research. Current K awards, or “career development awards,” fund investigator salary at \$75 to 105,000 for 50 to 75% workload.¹⁵ For academic departments, this means subsidizing K award winners to support market value salaries for surgeons. Young potential investigators require more small grants, nontraditional funding, or departmental support before finding financial independence for their laboratories.

Faculty Retention and Promotion

Traditionally, academic surgeons had some freedom from private practice pressures: they would take on the most difficult cases and uninsured patients, spend additional time teaching residents and students, and writing and traveling to promote academic excellence in exchange for different clinical production goals and decreased academic salaries. However, as academic departments are being forced to “tighten the fiscal belt,” they are having difficulty with retention of quality clinical and teaching faculty. Numerous studies note that work hours, prestige of job, and lack of appreciation have created an exodus from academic medicine.^{16–19}

A 2001 study of faculty at the University of Colorado found that 42% of respondents were “seriously considering leaving academic medicine in the next five years.”¹⁶ Predictors of intent to leave included work and life balance, absence of faculty development, lack of recognition of clinical work or teaching roles in promotion evaluation, and absence of “academic community.” In another study, five factors were consistently cited in physician frustration: “low morale and prestige, less than excellent patient care, loss of talented clinicians, lack of commitment to improve patient care systems, and fewer excellent clinical role models.”¹⁷ Other factors including the salary differential between academia and the private practice, inadequate recognition, and reward systems were noted to drive excellent clinicians from academic settings.¹⁸ This trend, according to other researchers, is occurring juxtaposed with new work hour restrictions, reduced resident contact time with patients, and may seriously affect the training of a new generation of physicians.¹⁹

In addition, pathway to promotion is less well defined for academicians who are primarily clinically or teaching focused, rather than research oriented. Numerous authors have discussed new promotion and feedback guidelines, rather than traditional roles.^{15,20} Arana and McCurdy believed faculty should be judged on “teaching, research, clinical care and administration” with regular feedback, not just research.²⁰ Others have also advocated that administration should be part of the evaluation process for all who remain in academic medicine.^{21,22} Advancement and promotion are often based on antiquated methods of evaluation along traditional lines, rather than an integrated approach that might better serve current academic scholars.²¹

Bringing new guidelines into practice may be difficult. In one report, Huber describes two faculty members undergoing assessment for promotion.²² One cataloged activities along

standard criteria of research, teaching, and clinical. The other used new university-approved guidelines advocating an integrated approach to traditional roles. While equivalent in achievement, the second faculty member failed to get promotion until she separated out her curriculum vitae into standard promotion categories.

While the loss of talented personnel is a problem for many reasons including decreased morale, skill, and mentorship voids, it is also financially expensive. Depending on location of institution, recruitment and startup costs may range from \$113,000 to \$926,000 per physician.²³ Approximately 48% of entry-level faculty members leave their initial appointment. While 21% move to another academic appointment, 79% of faculty members leave academia entirely.²⁴

Innovations for the Future

Despite its challenges, scholarship in academic medicine continues to serve an important role in health care. Creation of cutting edge treatments and innovative technologies, basic science research and advancements, and the education of a new generation of excellent clinicians are all vital roles of academic surgery in our society.²⁵ Ideas for the future of academic surgery must incorporate formulas for how an individual surgeon might be successful as well as more global question of how academic surgery can find a new role in the new century and global health care community.

Individual and Departmental Adaptations

For the individual, there are many tools to help the young surgeon enter and prosper in the world of academic scholarship. The Association of Academic Surgery (AAS) is an organization devoted to the promotion of surgical research.²⁶ The society serves as a forum for young academic surgeons to interact and share ideas and inspiration, with active membership terminating 10 years after first academic appointment. Each year, AAS sponsors a course to provide guidance to surgeons starting out in academia. In this course, critical topics such as setting priorities, funding opportunities, and self-promotion are discussed. In 2012, Herbert Chen and Lillian Kao published “Success in Academic Surgery,” sponsored by the AAS to reach more young academicians for whom attending the course might not be possible.²⁷

Other organizations also have means to support or mentor young academic surgeons. The American College of Surgeons sponsors mentorship programs for women in surgery.²⁸ Individual societies, such as the American Society of Colon and Rectal Surgery have interest groups or committees, specifically designed to cater to young surgeons and provide support and mentorship.²⁹ Specialty societies, such as the Association of Women Surgeons and the Society of Black Academic Surgeons, also provide research, clinical, and teaching opportunities for those who may qualify.

Many institutions are reinventing the way that faculty are evaluated and rewarded within the department. Division chiefs and departmental chairs may no longer expect that

every faculty member will be an independent triple threat. The department as a whole may have clinical, research, and teaching goals. While one or two members may be clinical “powerhouses” with minimal academic responsibilities, others may be provided protected time and discretionary funding for more traditional research, or research education roles. Goals are reached as a department or division, rather than individuals. Success is defined by everyone reaching their personal goals, and collectively attaining the academic goals of the department. This idea that faculty are rewarded for the jobs they are given, not just for being a triple threat, is a newer concept. “Teaching should be more than enough to promote; it’s our job.”¹⁶ There are multiple promotion models at many institutions; in addition to scientist, clinician-scientist, clinician-educator, and even clinician-administrator are options for faculty looking for advancement.

One such example is a task force at the Perelman School of Medicine of the University of Pennsylvania.²¹ Charged and supported by the Dean, the task force looked to nontraditional academic role models such as business and technology to produce recommendations for institutional change. As part of their work, they created a new tenure evaluation system that accounts for individual academic career plans, rewards, and develops leadership, and supports junior faculty and mentorship.

Rethinking Academic Surgery

In other ways, academic departments may be redefined. Although earlier only medical school affiliation and academic sites were academic, more research is now coming out of nontraditional departments. In his talk, “Surgery for Street Fighters,” Jeff Ponsky³⁰ discusses several proficient surgeons who have made significant contributions to academic surgery not with basic science but with clinical volume, application of new technology, and quality results. These academic leaders are not in academic environments, but in private practice groups. However, these leaders are proficient authors, excellent teachers, and phenomenal clinicians, a true triple threat in a nontraditional setting.

On a more global level, academic surgery needs to find new ways to rethink and reinvent itself to remain vital and viable in 2013. In 2004, the *British Medical Journal*, *Lancet*, and others created the International Working Party to Promote and Revitalize Academic Medicine (ICRAM).^{31,32} Twenty academic medical professionals from around the world were tasked at identifying challenges facing academic medicine and explore possible scenarios for the future of academic medicine. In their thought-provoking discourse, they played out five different possible scenarios for the future.³¹ These include the complete privatization of academic medicine, a dynamic integration of all current stakeholders, and a global health cooperative.

Through exploration of these scenarios, the group became aware of common features of all scenarios³¹:

1. The range of types of academic institutions is likely to become more diverse, with medical schools or academic centers being just one of these types.
2. Academic medicine needs to put more effort into relating to its stakeholders—the public, patients, practitioners, politicians, and policymakers.
3. Academic institutions need to become more “business-like” and more adept at using the media.
4. Competition among academic institutions is likely to increase and to become more international.
5. Academic institutions must be more globally minded.
6. Teaching and learning will become even more important, dissatisfied students may go elsewhere. Learning will be life long and depend heavily on information technology.
7. Although teamwork will become more important, individuals also must be allowed to shine and flourish.
8. Expecting an individual to be competent in teaching, researching, improving, leading, and providing service will become increasingly impractical.
9. It will be even more important to combine research, both basic and applied, with implementation and improvement.
10. The thinking and skills of academic medicine must become broader, combining with and learning from other disciplines such as economics, law, ecology, and humanities.
11. Thinking about the future will become both increasingly important and difficult for academic institutions.

These principles create goals and challenges for academic medicine and academic surgeons. To find success, academic scholars will be asked to prove that they play a unique and important role in pushing research and discovery, in educating a new generation of surgeons, and in providing the best in clinical care for their patients.

Conclusion

The 21st century will be a time of redefining academic surgery. Although in the past, academic surgeons were asked to be teachers, researchers, and clinicians, future generations will need to adapt to changing financial pressures, new administrative needs for academic departments, and engage in the global marketplace. Leaders who help to herald in a new definition and generation of academic surgeons will have a unique opportunity to mold academic surgery and at the same time face significant challenges in proving the relevance of academic surgery.

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