Overview: Getting Involved in Research as a Busy Practicing Surgeon

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Abstract

To succeed in academic surgery in the current era, it is important that a surgeon brings a unique attribute that enhances the mission of the institution beyond the scope of surgical mastery and relative value units (RVUs). Given the increasing pressure on a surgeon to produce RVUs, how can a prospective surgical scientist successfully develop and maintain a research program? The establishment of a successful research program requires planning that begins in surgical residency and careful decision making along the way with clear focus of goals. This article will provide insight into the steps to consider along the way as you work to establish your successful research program.

Keywords

- academic colorectal surgery
- research

CME Objectives: On completion of this article the reader should be able to have a better understanding of the issues surrounding the development of a successful research program as a busy colon and rectal surgeon.

To succeed in academic surgery in the current era, it is important that a surgeon brings a unique attribute that enhances the mission of the institution beyond the scope of surgical mastery and relative value units (RVUs). Many individuals assume the role of educators or administrators during their careers to meet this goal. Although a decreasing number of surgeons choose to augment their practice with research,¹ there is no disagreement that these types of endeavors add value, as contributing to current knowledge is central to the mission of any academic surgery department. Given the increasing pressure on a surgeon to produce RVUs, how can a busy colorectal surgeon successfully develop and maintain a research program? For the purpose of simplicity, this discussion will be focused on developing a basic science research program while maintaining a busy surgical practice; however, surgical research can take many forms including education, health services, clinical, translational, and basic science. The principles highlighted here will be applicable for developing any of these forms of research.

Building the Foundation

The key to a successful research program begins during surgical residency. The successful academic surgeon often

has spent several years doing some form of research during their training. Although some of this experience may or may not have culminated in a terminal degree, it is the mentorship that comes along with an experience like this that is most vital to an individual's development as a researcher. The mentor teaches the critical thinking skills that a surgeon will need to successfully implement and run their own research enterprise in the future. For example, it is important to spend a significant amount of time reading the literature broadly to learn about new research trends and their applications. The mentor should also encourage creativity with trying new avenues of research. Although it is easy to do what others before you have done, this is common and leads to stagnant science. It is more beneficial for the resident to learn new skills and be innovative.

After obtaining the critical thinking skills and tools of the trade, one must next begin to think about the focus of research. When choosing a fellowship, the resident should consider the area he or she ultimately wants to study and then use the fellowship to concentrate on the research topic. This allows for the development of a deep clinical expertise that is required to ask and understand the relevant questions that can be studied. Most successful clinical researchers develop a program that very closely mirrors their clinical practice.

This is also a good time to do some real soul searching and determine why you want to establish a research component to your future practice. If your main reason for establishing this program is not focused on advancing scientific knowledge of

a disease interesting to you, you may want to re-evaluate your priorities. Maintaining a surgical practice and being successful and productive in research is very difficult, and if your passion is for anything other than helping patients by advancing science, it will be very hard to maintain your energy and focus.

Finding the Right Job

The next obstacle in the career of an academic colorectal surgeon is finding the right environment. Because others are examining this topic more deeply in this edition, I will not explore the intricacies of the first job in much detail. Suffice it to say, this is a critically important decision that is directly reflective of one's future success. From a research perspective, the key to finding a position that will allow for your success is to really evaluate what your future partners want from you. In particular, ask if the recruitment is being driven by current volume or an opportunity to expand. In the former situation, you will begin your practice with a clinic full of patients that will lead to operating every day. This is a great feeling for a junior faculty, but it does not allow for the time necessary to develop a research program. Alternatively, if your future partners are looking to expand, this means that the initial volume will be more manageable and that they want to grow the program. This will allow for some initial flexibility as you build your clinical practice while simultaneously providing the time to establish your research program.²

In addition to considering what your future partners want and need, you must consider what your future chairperson expects from the recruitment and at the same time, critically examine the department to determine if the chair has established the environment to support your goals. For example, if your goal is to establish a federally funded research program and your chair supports this goal in spirit, look to see if there are others in the department who have achieved the same goal. A chairperson who supports you in spirit is not nearly as critical as one who supports you in action. Dr. Fabrizio Michelassi noted the importance of the supportive chairman in his presidential address to the Central Surgical Association in 2006.³ Dr. Michelassi observed that the critical factor underlying his success in his basic science research career was his department chairman's dedication for developing the academic surgeon as a clinician, researcher, and teacher.³

Trying to decipher your chair's desires can sometimes be difficult. In addition to determining if others in the department have accomplished these goals, look at the infrastructure of the department. Examine if they have invested resources into establishing a grant support office. It will be of utmost importance to have administrators who can help you navigate the intricacies of the funding policies of an academic institution. These individuals should also be available to help you prepare the administrative portions of the grant including help with getting the grant filed. A department that has this type of infrastructure likely has many funded members and will have a clear idea of how to help you achieve your goals.

Setting Yourself Up for Success

Once you have identified the job right for you, your homework really starts. Your first step is to identify a good mentor. This person is perhaps the most important person in your academic career—more important than your section chief, your division chief, or even your chair. The ideal mentor is someone who understands the stresses of academic medicine.⁴ This does not mean the person has to be a clinician, it simply means the person has to have been around a medical school long enough to understand the implications of a busy clinical practice on a person's time. This individual does not have to be in your field of expertise; however, your mentor must add value to your career. This might come in knowledge in your field, knowledge in another field critical for your advancement, expertise in mentoring young medical school faculty, or perhaps just by virtue of their scientific acumen being someone from whom you want to learn.

Finally, you must deal with the issue of laboratory space. In order for you to obtain an independent investigator research grant, you will ultimately need to have your own dedicated laboratory space. However, until you are ready to submit that grant, this is not a necessity in the development of the foundation for a successful research program. Although there are many models that can likely lead to success, one option is to view this period of your life as a postdoctoral fellowship. In this model, your laboratory space is in that of your mentor's. You may have a bench in your mentor's laboratory along with a desk among the students and postdoctoral fellows. This has the added benefit of allowing you to continue to develop your skills as a researcher through collaboration with your mentor and other scientists while preventing delays in starting your research program due to the space limitations that frequently plague many academic institutions. This model requires that you trust your chairman and your mentor to keep your best interests in mind. It will be up to them to ensure that you have that space designated to include with the first grant application. However, in the interim this can be a viable solution for getting your research program off the ground.

The Value of Time

Whenever the topic of research success is discussed, several questions are always asked. The first is, "how much protected time do you have?" The second is "how do you protect your time?" This is usually followed by "does your chairman allow you to have protected time?" The answers to these questions are not complicated.

First, "how much protected time do I have and how do I protect it?" In my view, I do not have any "protected" time. All of the time is mine, and I am able to use it as appropriate. Like everyone, I have some clinical responsibilities, and when I am not performing those clinical responsibilities, my time is free. When I started on faculty, I negotiated for the calendar schedule given in ► **Table 1**.

I felt this amount of free time on my calendar would be perfect for spending time in the laboratory, for the following reasons. First, with a template like this I would be able to write

Table 1 Q2 Calendar schedule

Q2

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Free	Free	Free	Free	Operative block
PM	Free	Free	Free	Clinic	Operative block

for a career development award which requires a research commitment of 75%. Second, and more importantly, it gave me a large 3.5-day block every week that I could spend in the laboratory. This was a large block of time that I would not need to be in the hospital at all. This turned out to be one of the biggest contributors to my early successes as I found early on that time in the hospital was easily lost. Because I chose my first job wisely, this was not a difficult negotiation. In fact, all parties from the chairman to my most junior-level partner agreed with this template. This buy-in from all parties was critical as my salary was guaranteed for a period of time and I had no RVU target. This allowed me to really focus all of my energy on developing my research program.

The time listed as free on the template was mine and allowed me to dedicate time to building my academic research practice. It also allowed me the flexibility to help my colleagues when there was heavy clinical volume without having to commit to a long-term change in my practice. I have been able to adapt my clinical obligations as needed while ensuring a dedicated commitment to research endeavors. Over the years, while I have added some more clinical and administrative time, my template has not drastically changed. I continue to have blocks of time that appear on my calendar that are protected by me. No one is allowed to schedule into these blocks without my permission. If you are going to be a successful surgical scientist, you must have time blocked on your calendar to be academically productive, and you must rigidly control this time.

In the situations where your partners are supportive from the beginning, it remains important to ensure that they continue to understand the value of your research time. It is easy to fall into the pattern of helping out “here and there” with busy case volume and depleting your research time. Depending upon your research focus, your progress can translate to real world applications that enhance the quality of care for the entire practice. Regular updates and collaboration with your partners can help them to appreciate that your work outside of the operating room brings value to a growing academic surgical practice.

The last question that always arises is related to the pressure I feel from my chairman. This comes down to your choice of first jobs. When you choose your first job, you must be clear with your goals, and you must work for a person who shares your values and expects you to achieve your goals. If you do this well, you will not feel pressure from your chairman to alter your career path in a way that is not in line with your goals. However, even with careful examination, your chair may have different expectations of you once you start your career than you initially realized, or a new department chair may have a different vision than his or her

predecessor. If this is the case, the pressure put on you by your chair could be real. In this case, you will need to rely on your mentor or other close colleagues to advocate for you. Regardless of your situation, it is in your best interest to identify those in your department who “have your back” and maintain a strong relationship with them. As you work to get funded and try to stay out of the operating room, you will need these people to advocate for you.

Models of Research Programs

Independent Research Program

It is safe to say that the most sought after research program is the independent program. This is one in which the young investigator has his or her own laboratory with individuals working toward a common goal in collaboration with the principal investigator. Before committing to this model, it is important that you ask how much of your time you are willing to take away from patient care and dedicate to your research program. If you want to have an independently funded laboratory, you will have to dedicate a significant amount of time in the first 5 years, and if your program is to remain successful, you will have to continue to dedicate a significant amount of time as your career progresses. If having an independently funded program is your goal, you may not be able to be as involved in administrative or leadership activities as you want. In other words, something will have to give in order for you to maintain the successful venture over time.

One thing to consider early on is hiring someone to help you succeed. Your first hire is very important, and there are many ways to incorporate this role into your program. The first decision you need to make is whether you need the support of a technician or a scientist to be successful. It is critical to draw this distinction as these folks have very different roles in your laboratory. Ideally, a technician is someone who can keep the experiments going during your absence. This person will take direction from you and will do the experiments for you. This type of person frees up your time and allows you to spend your time reading, writing, and thinking about the direction of the research. The role of the scientist goes beyond doing experiments. The scientist helps mentor students and residents, helps to write articles and grants, and thinks creatively about experiments. In addition, a good scientist will help you set the direction of your laboratory.

When making your first hire, consider the experience of the person and the stage of life the person is in when trying to decide on the best fit for your group. Experience is obvious and always a bonus if you can find someone who has it. Stage

of life refers to the person's plans and goals. For example, there are always new graduates looking to spend a year or 2 working in a laboratory while they try to get accepted into medical school. These folks are at a point in their life when they are trying to develop their careers and often lack experience. They may be willing to work for a lower salary or even for free for the benefit of the experience such a project would give them. Although this type of person may be attractive on some level, they will likely prove to be a lot of work for little gain. They will require a lot of time and effort to train and will then be gone within a short time as they move toward their own goals. It can be very rewarding to be involved with young people at this stage of their career. You can be a very important mentor in their life, but this is not the person you want to help get your laboratory established.

I felt it was important for me to set the direction of the laboratory early on in my career. Therefore, the first person I hired was a laboratory technician. I hired this person within the first few months of starting on faculty, spending a significant amount of my startup money. I felt it would be important to have this person doing experiments and moving the program forward even if I could not be physically present in the laboratory every day. Therefore, I looked for an older, more established person who had experience and was lucky to find a person with years of experience who was looking for a job change. Having a person who was capable of working independently proved to be invaluable because he was able to help me develop the laboratory while I attended to the needs of an expanding colorectal surgery practice. Even with dedicated research time, it is important to remember that your clinical practice will grow and that this is also vital for you to succeed in your career.

As my clinical practice developed and my laboratory practice became more established, I felt that hiring a scientist would help keep my laboratory on track while I was spending more time in the operating room. After receiving my career development award, I applied more of my startup funds to the hiring of a junior scientist. This was another decision that has proven to be critically important to our laboratory's success as this person has helped move all aspects of the laboratory in a positive direction. For example, with the laboratory manager's assistance, he oversees all daily activities in the laboratory. He mentors undergraduate and graduate students as well as the surgical residents in the laboratory. He assisted with writing our last grant and does the lion's share of writing on the articles. In addition, he was instrumental in developing a new transgenic model and oversees an ongoing line of work in the laboratory. Although there have been ups and downs in our relationship, overall hiring a scientist has proven to be one of the best decisions I have made.

Collaborative Research Program

The alternative to an independently funded laboratory is to be a coinvestigator or a key collaborator for a member of the research community at your institution. This is an option that can lead to a very successful research career if you align yourself with the right people. Two fundamental areas that

are important to explore when considering this route are how does one find the right people and what do you have to bring to the table.

First, how does one find the right person or people with whom to collaborate? You can frequently identify a collaborator simply by looking through the online research pages of members of your medical school's basic science faculty. You will likely find someone's work that piques your interest and is evaluating a question that you find applicable to your clinical focus. The next thing to do is to read some of this person's work. You will also want to check on the status of his or her funding situation. I recommend you go to the National Institute of Health Research Portfolio Online Reporting Tools (RePORTER), Web site (<http://projectreporter.nih.gov/reporter>), and determine how well funded this person is. If you find someone who is funded and seems to have a research program that interests you, reach out to this person. Send an email, make a phone call, or just stop by the laboratory. Be persistent and find a way to initiate a conversation.

You may wonder why a successful scientist would want to collaborate with a surgeon. The first thing you have to acknowledge is that as a busy practicing surgeon, you represent a tremendous resource for the basic science community of your institution. You have the opportunity to add value to a basic scientist's research program in two key ways. First, you bring clinical knowledge and experience that the scientist does not have. This cannot be discounted and will help bring the investigation real clinical relevance and credibility. Second, you have access to patients. Without access to human subjects, a basic science program cannot move into translational science. The fact is that most scientists recognize that a basic science program has to have some component of translational science. I have never met a scientist that does not want his or her work to impact patient care. Therefore, you have the potential to be an incredible asset for the scientist.

One risk to be aware of is that of becoming a source for clinical tissue. Many scientists will see you as a resource to bring tissue to them. This type of relationship does not constitute a healthy collaboration and can lead to hard feelings. However, it does require less time, therefore, making it a reasonable opportunity for the busy surgeon. If this is the relationship you want, you will have to recognize that you will not have any input in the scientific direction and will have little to no say in the research program. You must also realize that in some circumstances providing tissue alone may not meet requirements for authorship of any article that comes from your collaboration (see the authorship recommendations from the International Committee of Medical Journal Editors at http://www.icmje.org/roles_a.html). An alternative to this type of tissue-provider role is to be an active participant in the research. Therefore, at your first meeting with your potential collaborator, you should make it clear that you want to be intimately involved in the work being done in the laboratory. After this meeting, it should be clear that you want to participate in laboratory meetings, help write articles, assist in writing grants, and most certainly lead any human studies that are done relating to the work in the laboratory. A

relationship of this sort can be both personally and professionally rewarding.

If you and the scientist recognize the importance of your interest in collaborating, a mutually rewarding relationship can develop. It is important for you to give some thought to this relationship before it develops. Like a marriage, a collaborative relationship will have its ups and downs; it will require work. You will have to spend time—time in laboratory meetings, time writing institutional review board applications, time writing and reviewing articles, and perhaps even time assisting with grants. If you are not willing to put in this kind of time, the relationship will not develop and will not be sustained.

Getting Involved with Industry

Industry-sponsored research is another avenue that junior faculty can pursue. This type of research can lead to a successful career but can be fraught with complications. Before aligning yourself with any industry sponsor, it is generally recommended to fully review your institution's conflict of interest policy. In addition, most universities have an office dedicated to sponsored research programs. Before you sign a contract with an industry sponsor, it is advisable to discuss the relationship with the administrators at this office. These offices often have people available who will help you negotiate a deal that is rewarding to both the institution and you.

In most cases, university faculty may develop a relationship with a company that wishes to support the faculty's research interest. Most companies will have some form of a competitive grant mechanism which allows it to support research related to use of its devices/drugs. You can find these mechanisms by searching their respective Web sites or by talking with your institutional representatives. In general, these grants require an application and are quite competitive.

In addition, they often have specific requirements related to results or progress reporting that are presented to the company. Before applying for these awards, you must understand the terms of the award and be sure that your institution's conflict of interest policy is in line with your participation in such a process. You also must assure that the company will allow you to publish your work without requiring their approval of the article. If done correctly, support from industry can be instrumental in your developing research program.

Summary

Having a productive research program at the same time as being a busy academic surgeon is possible. A successful program requires planning and preparation before taking your first job. Once in your first job, achieving your goal requires dedication, efficiency, and a significant amount of institutional support. Your success will depend on the relationships that you build within your organization as well as finding a balance between clinical and academic commitments. The rewards of being both scientist and surgeon far outweigh the stresses of living this dual life.

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