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Advice on academic research in hand surgery

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I benefit greatly from active learning, mainly through reading and interactions with other clinicians or basic scientists of various fields, such as participating in conferences and personal communication. These help greatly in mastering knowledge and understanding the central issues of a particular problem. However, I must stress that the real keys are to think independently and have a questioning mind. Indeed, advancing a field of work calls for extensive reading to know precisely where we stand, but reading without in-depth thinking does not aid in tackling complex problems.

Clinical studies

Understanding the time they take

Clinical investigation takes years or decades to accomplish. Be prepared for this time frame. It is essential that you do not change study topics frequently. And you should not attempt to tackle more than two or three clinical research fields at the same time. To make a significant contribution you must devote years or decades of effort.

Every patient can become the inspiration for a clinical study

In clinical practice, you should be open and ready to discover problems that others have not noticed. Most doctors fail to catch issues that require profound thinking while they are seeing patients. However, many ideas stem from clinical work and will mature as you see more cases. Each patient is unique in some way; they can inspire you to think. Technical modifications used with a single patient could lead to the development of new techniques.

Take clinical questions to the laboratory and come back with potential solutions

An essential approach is to reproduce clinical situations in a laboratory setting, to figure out the pathologic mechanisms, and to explore novel methods of

treatment. Ultimately, you will return to the clinic with new methods that have been proven effective in the laboratory and can then try to validate them clinically through outcome assessments.

Basic science

Read extensively before you start

This is critical when you start a new project or research into an unfamiliar field, as it can identify obstacles and keys to success. Such reading is not simply a literature search, to verify that no one has done this work or reported on it before. Such a void is not a reason to perform the work. You must understand the key facts in a field through finding the wisdom that is sometimes buried deep in the publications of your peers (often in the discussion section). You need a mastery of the current techniques of research, as well as the key obstacles or concerns in the field. Starting a new investigation without adequate preparation is often a waste of time and resources. Progress in research should be built on thorough mastery of what we presently know.

Have discussions with someone knowledgeable

Not all of us are fortunate enough to have direct communication with somebody profoundly knowledgeable in the topic that interests us. However, you may attend conferences to listen to lectures or discussions by leading experts. Critical questions may be raised, and potential paths to good solutions may be discussed. A good lecture can provide great inspiration, and you will benefit from attending well-organized conferences. Take notes and write down your thoughts and ideas. Some ideas flash through the mind and vanish quickly! During a stimulating conference or discussion, fresh ideas are likely to occur to you. I immediately jot down ideas (i.e. study designs) on whatever is at hand – i.e. a napkin or scrap paper – wherever I am. Most researchers are very generous with their ideas and time and will be

happy to be approached for advice about a potential study.

Do not rely on fancy tools

Novel tools and methods can generate new, helpful, more clearly defined, and sometimes recondite data. However, new methods are not necessarily the best way to achieve your goals. The latest tools may produce fancy articles, attractive presentations, and appealing grant proposals; unfortunately some investigators see these as the final goal. I believe it is essential to understand the essence of problems for which you seek solutions using the tools you have available, even if they are not the newest or most advanced. In my experience, some fundamental findings have come from astonishingly simple studies, using primary tools and a clear and open mind.

Additional general tips for academic research – clinical or basic

Develop curiosity towards unsolved problems

A successful academic career should be guided constantly by curiosity and observations at each step, rather than by following a well-planned route. In my experience, new and unexpected questions arise at each step forward, calling for constant adjustments in direction and focus. Meanwhile, I must continually use my judgment to avoid spending time on projects that generate publications but have no lasting value, and resist the temptation to pursue accolades for work that will soon be forgotten. These are often not easy.

Writing on something that is important

Clearly there is a trend towards generating multiple often weak publications, which is generally a waste

of time. If you aim to devote yourself to the advancement of a field, do not write about meaningless findings simply because they are publishable; focus on meaningful work. Writing and publishing eat up a great deal of time. If the long-term goal is to push the field forward, limit your writings to important topics.

Nevertheless, do not hesitate to write once you have established that your work is reliable and worthwhile. I consider it a duty to publish, though the work should not be publication-driven. I usually encourage my research colleagues to repeat key parts of a completed study before accepting and writing up the data. This maintains academic rigor and helps maintain the reputation of the team. Publication in a journal by no means proves the findings correct or indicates their value; it merely initiates the process of spreading the findings and seeking outside verification. The value of a study can only be ascertained years or even decades after publication, through application to succeeding work by other investigators and ultimately its impact on the advance of a field.

The advantages of knowledge, skills, and training outside medicine

A love of literature, paintings, and photography and many other pastimes are both a rest and mental therapy. I have been fascinated by classical Chinese novels for their simplicity of writing, the wisdom offered by their seemingly simple text, and the authors' spiritual sophistication. Many of those authors were never recognized or rewarded during their lifetime. This sets an inspiring example for those devoted to the advancement of any field through tireless pursuit.

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