A View from the Inside

By Dr Tai E Shyong

When people ask me what my job is, I now tell them that I am a Clinician-Scientist. It seems like a good idea, considering the publicity life sciences has received in the popular media. Among the medical profession, this often draws comments like, "Oh, good for you" or "We need people like you" or just "Oh....." Among my non-medical acquaintances however, apart from the black stares, I often hear "Oh, but I thought you were a doctor."

A little introspection is a good thing. So the first thing I did when I was asked if I could contribute an article to the SMA newsletter about "Clinician-Scientists in Singapore", was to sit down and think about it. In writing this article, I decided I would turn to the literature. Not the academic, scientific literature that I spend my days reading, but to the wisdom of some of the great scientists and writers of our times commenting on science and medicine.

"Formerly, when religion was strong and science weak, men mistook magic for medicine; now, when science is strong and religion weak, men mistake medicine for magic." – Thomas Szasz, M.D.

I believe that the above is true for many today. There is no doubt that many people who are not in the medical or one of its allied professions have believed that doctors are somehow the holders of the truth. That somehow we know the right answers to all their questions regarding their health or the symptoms that they suffer, and that we will always know what to do to make it better.

As recently as 1984, Eric Cassell wrote:

"The changes in medicine that are occurring today are part of a larger social upheaval.... This social movement...is marked by a turning away from science and technology – even, on occasion, from reason itself.... With time it will become apparent again that science and technology are not the enemies; and..."reason" is not inherently atomistic or reductionist, nor science the enemy of persons. Then the search for the solutions to the problems faced by medicine... will inevitably involve the development of new and exciting intellectual tools."

It is a tribute to human society that this transition has occurred in the two decades since these words were first printed. As a consequence of these changes, our doctors are taught to question the validity of everything they are told, just as our patients now question the appropriateness of the treatment we prescribe. After all:

"True science teaches, above all, to doubt and to be ignorant." – Miguel de Unamuno

It is now up to those of us involved in the study of the life sciences and the provision of health care, to take up the challenge set before us, to take medicine and health care forward, in a way that society now demands of us.

"I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories instead of theories to suit facts." – Sir Arthur Conan Doyle, Sherlock Holmes

As physicians, we need to collect data on the patients and diseases that we treat, in order to make informed decisions on treatment for our patients. For many years, medical training has been an apprenticeship. One collected data by watching and working with great clinicians, observed the way things were done or the way patients respond to a treatment prescribed, until it was safe to try it on our own. Today, we add to that through our own reading of the experiences of others as described in the medical literature.

"Each problem that I solved became a rule which served afterwards to solve other problems." – Rene Descartes, Discours de la Methode

The human mind is a wonderful thing in its ability to take an accumulation of experiences and convert it into a set of rules that can be used to "sense" nuances in a patient or the disease. Through time, one developed an almost instinctive feel for medicine. I believe that these "feelings" or "instincts" are the basis of hypotheses which are tested on the battle grounds that are our patients' bodies. What modern science has done is given us the tools to test these hypotheses more quickly and with greater precision than ever before. Our understanding of basic biology, chemistry and physiology has also given us an ability to formulate hypotheses more easily and with greater complexity than before.

"Medical scientists are nice people, but you should not let them treat you." – August Bier

The problem we face is how to build a bridge between the clinician, for whom patient care takes up the majority of his/her time, and the scientist, who is tucked away in a laboratory. One possible way is to take a bunch of people who have spent several years practising medicine as clinicians. You then give them the time and the freedom to explore the basic science involved and develop the scientific skills to test some of their own hypotheses in the laboratory. At the same time, you give him/her the opportunity to interact on a daily basis with other scientists. These people then become a group that straddles both sides of the fence. On one side, they have the ability to make observations through their own treatment of patients or through interaction with their other clinical colleagues. At the same time, they possess sufficient understanding of basic biology and science to interact with scientists who may be able to

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Following his undergraduate training at the University of Dundee in Scotland, Dr Tai E Shyong (MB ChB, 1990) pursued post-graduate training, first in internal medicine, then in endocrinology at the Singapore General Hospital. He has recently returned from a HMDP fellowship in Boston where he studied the genetics of cardiovascular disease. Currently, he is employed as a Clinician-Scientist in the Singhealth cluster.

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provide some of the tools required to test the hypotheses generated in the clinical setting, or to develop new hypotheses based on information derived in the basic laboratory that can be tested in the clinic. In a flash of artistic creativity, you could combine the two terms and call them: Clinician-Scientists.

"This time element is essential. The investigator may be made to dwell in a garret, he may be forced to live on crusts and wear dilapidated clothes, he may be deprived of social recognition, but if he has time, he can steadfastly devote himself to research. Take away his free time and he is utterly destroyed as a contributor to knowledge." – Walter Bradford Cannon

What then sets the Clinician-Scientist apart from the clinician? After all, don't all doctors have some understanding of basic biology? Don't all doctors read the medical literature? Don't they all have scientific, disciplined minds that should allow them to formulate and test their own hypotheses? Can't they talk to their colleagues and discuss interesting problems and find scientists to talk to and have coffee with? The answer to all these questions is "Yes." What differentiates a Clinician-Scientist from a clinician is the quantity and quality of time he/she chooses or is allowed to devote to science as opposed to the provision of patient care.

When one is sitting in a busy clinic with a pile of case notes rising halfway to the ceiling, patients wanting to know more about their condition, and at the same time knowing that the number of patients seen and the waiting time are constantly monitored, it is hard to notice if a patient is behaving slightly differently from all the other patients treated for the same condition. Even if one makes the observation, it is hard to find the time to sit down and think about why this occurs. Trying to do this while grabbing lunch on the move and rushing off to another clinic, to the wards or to a meeting, is akin to thinking that it would be possible to become a virtuoso musician by practising only when you are free, such as at the bus-stop while waiting for a bus.

While we do not live on crusts and wear dilapidated clothes, hypothesis generation and testing, the very fundamentals of science, take time. I believe the hallmark of the Clinician-Scientist is a commitment to spend time doing the thinking, reading and experimentation that are going to form the bridge between the clinician and the scientist. Commitment is key to the success of the life sciences programme in Singapore: commitment from the people who do the work; serious commitment from the establishment to their work to allow individuals the time they need to do their work. There is risk involved. As Clinician-Scientists, we don't really know if we can produce the deliverables that are asked of us. After all, that is the nature of science. We are looking for the unknown. Likewise, the institutions that pay our salaries don't really know what the final measurable outcomes will be. I see it as a sign of maturity of the health service, that over four to five years, the establishment has seen fit to pay my salary to sit about carrying out some of these activities that I have described. It was not so long ago when my own worth was measured largely in terms of the number of patients I saw.

What then is the role of the Clinician-Scientist in Singapore? It is my hope that the role of the Clinician-Scientist is a transitory one. We need to show the establishment that, for those who enjoy it, the provision of true protected time for research can result in useful enterprise that will translate to better patient care and economic gain. Once we establish this, it is my own hope that our institutions will mature from ones where research is merely encouraged, to ones where real protected time is provided for the pursuit of scientific activities. All clinicians would have the opportunity to become Clinician-Scientists to some extent. With all the talk about the life sciences industry, let us not forget that ultimately, our mandate comes from our patients and that we should strive first and foremost to reduce the burden of disease for human beings all over the world. It would also be worth our while to remember that scientific endeavor of any sort, as long as it is recognised as good science, will raise the profile of our nation as a centre for the life sciences even if it does not result directly in intellectual property and patents.

"The most beautiful thing we can experience is the mysterious. It is the source of all art and science." – Albert Einstein

Perhaps, like the "bug's eyes" at the Esplanade, our efforts will give us a better, multi-faceted view of the world we live in. ■