

# Medical Education: Ways & Means (Part 1) *By Professor Chee Yam Cheng*

## A HUNDRED YEARS AGO

Sir William Osler (1849 - 1919) was one of the world's most influential physicians with ideals and practical advice which are timeless. He saw medicine as a life long adventure. He became a strenuous advocate of continuing education. He stressed the need of a lifelong personal progressive training. "Medicine", in his own words "is a most difficult art to acquire. All the college can do is to teach the student principles, based on facts in science and give him good methods of work. These simply start him in the right direction, they do not make him a good practitioner - that is his own affair."<sup>(1)</sup>

Osler approached medicine mainly as a naturalist rather than as an experimentalist, which is to say that his basic method was to observe and reason rather than to analyze a single variable under controlled conditions. The naturalist's approach requires critical thinking. Osler credited the Greeks, especially the Hippocratic writers, for insisting that medicine should be based on descriptive observation rather than on religion or magic. "Empiricism, experience, the collection of facts, the evidence of the senses, the avoidance of philosophical speculation, were the distinguishing features of Hippocratic medicine."<sup>(2)</sup>

Observation must be combined with teaching. Men must see straight and men must think clearly. From these premises followed a straightforward philosophy of teaching. "Teach (the student) how to observe, give him plenty of facts to observe and the lesson will come out of the facts themselves. The whole art of medicine is in observation, as the old motto goes, but to educate the eye to see, the ear to hear and the finger to feel takes time, and to make a beginning, to start a man on the right path, is all that we can do. We expect too much of the student and we try to teach him too much. Give him good methods and a proper point of view, and all other things will be added, as his experience grows."<sup>(2)</sup>

How true these words are of our medical curriculum. If you ask students of yester years about the university medical curriculum, the common comment is so

much to learn in so short a time. Compared to students in the other faculties of the University, the medical faculty timetable is the one with the least breaks and holidays and the most subjects. Are we teaching too much? What is core knowledge? With advances in medicine, much knowledge is rapidly outdated. A famous saying of teacher to student is "I am teaching you today what I know, of which half will be out of date tomorrow. The trouble is, I do not know which half will be obsolete." And obsolescent medicine can be dangerous to patients. It is in this light that Problem Based Learning (PBL) has taken a foothold in the local medical curriculum. In their paper<sup>(3)</sup>, the authors stress that "PBL is not just a method of teaching, but more significantly it is also an innovative way of learning that goes beyond simply passive rote-learning." The learner is to be more active in learning. I used to marvel at the memories of my Chinese educated fellow students who because of the way they were educated, could recall pages by heart. Was that helpful to learning and thinking? A good memory is a useful faculty to have and retain. But memory alone is insufficient for medical practice.

Osler was a "note book" man. He told students, "Don't trust your memory, make notes, write down your observation." Observation must also be combined with reasoning. "The diagnosis of a patient's disease often stared one in the face, if one possesses a "seeing eye", has good light and possesses proper reasoning powers." To Osler, his curriculum for medical students was straightforward. They should learn progressively how to observe and how to reason; not only should observations lead to questions, but and perhaps more importantly, questions should lead to observations. "The art of the practice of medicine is to be learned only by experience; it is not an inheritance, it cannot be revealed. Learn to see, learn to hear, learn to feel, learn to smell, and know that by practice alone can you become expert. Medicine is learned by the bedside and not in the classroom..... Live in the ward. Do not

waste the hours of daylight in listening to that which you may read by night. But when you have seen, read."<sup>(2)</sup>

Osler held that the main goal of medical schools was to turn out effective doctors. "To be of any value, an education should prepare for life's work." Study people as well as books. "The problem before us as teachers may be very briefly stated : to give to our students an education of such a character that they can become sensible practitioners."<sup>(2)</sup>

## WHAT IS EXPECTED OF THE PHYSICIAN?

The practice of medicine combines science and art. The role of science in medicine is clear. Technology based on science is the foundation for the solution to many clinical problems : the dazzling advances in biochemical methodology and in biophysical imaging techniques that allow access to the remotest recesses of the body are the products of science. So too the therapeutic manoeuvres which increasingly are part of practice. Yet still the most sophisticated application of medical technology or the use of the latest therapeutic modality alone does not make a good doctor. The ability to extract from a mass of contradictory physical signs and from the crowded computer printout of laboratory data those items that are critical, to know in a difficult case, whether to "treat" or to "watch", to determine when a clinical clue is worth pursuing or when to dismiss it as a "red herring" and to estimate in any given patient whether a proposed treatment entails a greater risk than the disease are all involved in the decisions which the clinician, skilled in the practice of medicine, must make many times each day. This combination of medical knowledge, intuition and judgment is termed the art of medicine. It is as necessary to the practice of medicine as a sound scientific base.

In the care of those suffering, a doctor needs technical skill, scientific knowledge and human understanding. He needs to use these with courage, with humility and with wisdom to provide a unique service to his fellowman. Tact, sympathy and

◀ Page 3 – Medical Education: Way & Means (Part 1)

understanding are expected of the physician, for the patient is no mere collection of symptoms, signs, disordered functions, damaged organs, and disturbed emotions. He is human, fearful and hopeful, seeking relief, help and reassurance. The physician cares for people. Dr Francis Peabody said it well. "The significance of the intimate personal relationship between physician and patient cannot be too strongly emphasized; for in an extraordinarily large number of cases, both the diagnosis and treatment are directly dependent on it. One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring of the patient."

#### CLINICAL REASONING

Speaking to the Society of Internal Medicine 100 years ago in 1901, Osler emphasized what he called "the natural method" of teaching medicine. "In the natural method of teaching, the student begins with the patient, continues with the patient, and ends his studies with the patient, using books and lectures as tools, as means to an end. The student starts in fact as a practitioner, as an observer and repairer of disordered machines, with the structure and orderly functions of which he is perfectly familiar."<sup>(2)</sup>

Around the patient as the sole focus, the process of clinical reasoning revolves. This process is poorly understood but is based on factors such as experience and learning, inductive and deductive reasoning, interpretation of evidence that itself varies in reproducibility and validity, and intuition that often is difficult to define.

In a simplified model, quantitative clinical reasoning includes five phases.<sup>(4)</sup> The first consists of an investigation of the chief complaint through key questions that are included in the history of the present illness. These questions are supplemented by the past medical history and by a physical examination that emphasizes detailed investigation of potential key organ systems. In the second phase, the physician may select from an array of diagnostic tests, and with its own accuracy and usefulness for investigating the possibilities raised in the differential diagnosis. Since each test has its costs, and some entail risk and discomfort

as well, the physician must ask whether the history and physical examination are sufficiently diagnostic before ordering tests. Third, the clinical data must be integrated with test results to estimate the likelihood of conditions in the differential diagnosis. Fourth the comparative risks and benefits of further diagnostic and therapeutic options must be weighed to reach a recommendation for the patient. In the fifth and final phase, this recommendation is presented to the patient, and after appropriate discussion of the options, a therapeutic plan is initiated.

#### RIGHT AND LEFT BRAINS : EQ & IQ

At the California Institute of Technology, Dr Roger Sperry and two of his students did historic split-brain experiments and found after surgically separating and testing the thinking abilities of each half of the human brain, that each half of the brain has its own way of thinking and its own memories. Just as we have two eyes, two ears and two hands, we also have two minds.<sup>(5)</sup> The left brain is used for the likes of logic, judgment, speaking and mathematical ability while the right brain is the source of dreaming, feeling, visualization and intuition. Reading a book on how to practise medicine is the job of the left brain but getting "a feel for medicine" is carried out in the right brain. Thus our two minds have a partnership in which one side handles the language and logic while the other side does things that are difficult to put into words and symbols.

Creative thinking requires coordinating and using both sides of the brain. Flashes of insight and intuition are the result of right-brain thinking but analyzing these insights must be carried out in the left brain. In the PBL process a problem is presented and the students need to find solutions to the problem. Both logical and creative thinking are required. Research with the thought processes of highly creative people reveals them to rely heavily on the intuitive side of their brain.

When the results of split-brain research are considered in light of our education, a frightening fact emerges. We are developing only the left side of our brain while the right side is being suppressed and ignored. After years of conditioning, most

of us tend to think of "thinking" and "using your head" as only left-brain thinking. The intellectual who relies solely on verbal and logical abilities is incapable of creative thought because creative thinking calls for a combination of insight and intuition coupled with verbal and logical ability.

Most of our educating is done by left-brain types, who, in turn produce more left-brain types. Educational credentials and degrees are awarded to those who demonstrate the ability to use skills that are the product of left-brain thinking. And what is called "scholarly" research is usually little more than an exercise in verbal and / or mathematical logic that is almost totally devoid of any right-brain thinking.

The electronic computer is a tool capable of logical and abstract thinking. However in terms of split-brain abilities, the computer is nothing more than a gigantic left brain that is capable of doing left-brain tasks millions of times faster than we can. So such left-brain jobs are being computerized and the challenge to us is to develop right-brain thinking that will enable us to work in harmonious partnership with the giant, electronic left brains we have created.

We are aware of the Singapore school system where for too long, creative thinking has been neglected. It will be some years before the new generation of scholars join the medical faculty with at least a greater part of their right brain developed. Would it be necessary to wait till they arrive to see if PBL is a better system? ■

#### References:

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3. Gwee MCE, Lee EH, Koh DR. *What is Problem Based Learning? Sing Med A News 2001: Vol 33. No 4. Pg 5-6.*
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#### Editor's Note:

Part 2, to be published in the May issue of SMA News, will cover PBL, Residency Training and Continuing Education.