REVIEW

Perspectives in Medical Education
1. Reflections on the state of medical education in Japan

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Abstract. The current shortcomings in Japanese medical education are highlighted by identifying four major areas of concern, based on the author's personal observations at Keio University Hospital. The first of these is a woeful lack of clinical skills among Japanese medical students and residents. This lack springs directly from the complete absence of any bedside clinical instruction, which constitutes the second area of concern. The third is the attitude of faculty towards teaching as a burden that detracts and diverts them from their primary goal of academic advancement through research. Finally, there is no recognition of the value of a problem-based approach to teaching clinical medicine, so that clinical problem-solving skills have atrophied to the point of near-extinction in the current generation of Japanese physicians. The promise of problem-based learning (PBL) provides a crucial starting point for efforts to change the system. PBL emphasizes the importance of an integrated approach to clinical problems, and a reliance on critical thinking – the basis of primary care. This contrasts with the selective and highly specialized approach to disease, and reliance on sophisticated technology, which are hallmarks of specialty care. The effort to reform medical education will fail without visionary leadership and without the willingness to confront the truth, as unpleasant as it may seem to be. Both these crucial elements exist at Keio University at this critical juncture. It is this happy confluence that emboldens the author to hope that the future of reform is in good hands at this august institution. (Keio J Med 55 (2): 41–51, June 2006)

Key words: Japanese medical education, problem based learning, clinical instruction, bedside learning

Introduction

Health care in Japan is in a state of flux. The established tradition of reliance on specialty care is being forced to accept, for the first time, that it may have to coexist with, and maybe even yield some of its preeminence to, primary care.[1,2] To an outsider from the US, like the author, the need for such a transition appears, at first glance, to be not only obvious and essential, but long overdue. And yet, on closer examination, it becomes apparent that the complexity of the issues involved is far greater than that which appears so ''obvious'' to the outsider, both in quantitative and qualitative terms. After all, Japan provides its citizens with universal health insurance, while the US does not, despite the fact that Japan's total health expenditure as a percentage of the gross domestic product is approximately half that of the United States![3,4] Nor can the quality of the health care be called into question, in comparative terms. It actually assures better outcomes for its citizens compared to those in the US at any number of points along the age spectrum, based on measures such as natal, postnatal, and total infant mortality, the prevalence of low birth weight (<2500 g), as well as life expectancy at age 20 and age 65.[5]

Notwithstanding this success, there is now a growing recognition in Japan that the overwhelming emphasis on specialty care is detrimental to both the health of the system and the health of the public, and that this must change.[1,2] Unfortunately, the existing system of specialty care is sustained and perpetuated by a system of medical education that places no value on primary care

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training.[2] As a consequence of these twin forces (undue emphasis on specialty care, and a virtual absence of training in primary care), there exists in Japan today a serious shortage of physicians who possess the requisite clinical competence to act either as providers of primary care or as educators in general internal medicine.[1,5] Thus, a change in one must be paralleled by a change in the other for reform to take root.

In other words, it is mandatory that medical education adapt to support and sustain the larger and more fundamental paradigm shift that is being nurtured in the system of health care in Japan.[6] However, the need for reform in medical education goes beyond changing the emphasis from specialty training to general internal medicine training. It involves a radical departure from the traditional Japanese approach to student and resident training, based on the feudal ''ikyoku-koza'' system.[5,7] To an outsider unfamiliar with Japanese tradition, it bears a striking resemblance to an older Germanic tradition of apprenticeship. It is no accident, however, that this is so, since German medical educators played a major role in the evolution of modern medical practice in Japan.[8,9] However, that remnant of a bygone era remains in place in Japan even though it is so antiquated as to be no longer extant even in Germany!

This all-pervasive system presents a disconcerting, even forbidding, intellectual challenge to the outsider (like the author). Understanding its cultural underpinnings, however, is imperative, because only then is it possible to understand why the pace of reform in Japan appears so painfully slow. Societies that revere tradition do not take kindly to change. Therefore, reform that is as fundamental and far-reaching in its impact as to threaten a deeply entrenched tradition is rejected in such societies as being either unnecessary or harmful. As a result, the reforms in health care and medical education that are being introduced and enforced through fiat are being met with an inertia that consists of equal parts natural anxiety, overt apprehension, covert resistance, and obdurate denial. The inertia to change is no more than a natural successor to the overt refusal to change that was acknowledged two decades ago, when the first proposals were made to modernize Japanese medical education.[10] And it is as pervasive now as it was then, I must assume, based on my experiences and on what I have heard from several struggling teachers in Japan.

It is only by acknowledging the cultural imperatives that drive this resistance to change that one begins to understand it. That change is being considered at all is a tribute to the far-sightedness of those in charge of medical education in Japan. That it needs to be forced upon a recalcitrant system is understandable. That it will take time and a lot of heartache on the part of all concerned is only to be expected. That it is succeeding in some centers is nothing short of extraordinary. That it is occurring at all is attributable almost exclusively to visionary leadership that is committed to dragging the system, kicking and screaming, out of its inertia.

Yet, the successes in many of the lesser known outposts, for all the richly-deserved plaudits they must and do receive, are not the stories that bear watching. In such centers, recognition for the need to change requires the force of will of relatively few individuals. This is best exemplified by the pace of change in residency training programs at so many non-academic teaching hospitals across Japan. It is there that one sees a gradual, if still reluctant, recognition of the importance of teaching basic clinical skills and clinical decision making.[11] That is a self-sustaining change that will only increase in momentum as the popularity of the matching program increases, and market forces apply increasing pressure on hospitals to stay competitive in the race to attract the best residents.

So it is not residency training – the apex of the pyramid – that causes the greatest concern. It is the inertia to change at the base of the pyramid – medical student education – that is of greatest concern. This is no more evident than in some of the leading centers for medical education in Japan, where the well-entrenched interests see no incentive to change, and clinical instruction remains virtually non-existent.[5] There is, after all, no competition for the best students at these institutions, since the cachet of graduating from the top universities, and the opportunity such places provide for contacts with faculty who can provide significant help in future academic careers, far outweighs any deficiencies in the quality of education that is provided.

I have had the privilege of closely observing and participating in Japanese medical education during periodic visits to Keio University School of Medicine in Tokyo since 2003, at the invitation of Dean Kitajima and Professor Takahiro Amano, Head of the Department of Medical Education. During those visits, I have learned much that is new to me, observed even more that is utterly fascinating, and have been rewarded, most of all, in a way that most teachers can only dream about! These experiences motivate me to put down on paper the uniquely personal perspective that I have developed regarding medical education in Japan. This article details my observations regarding the state of medical education at one of Japan's premier institutions of medical education. They reflect my own approach to medical education, developed over three decades and three continents, and must be viewed in that light.

The observations described herein are not intended to replicate the well-documented need for reforms in the medical education system in Japan. They are, as I noted above, highly personal and subjective, derived

from my impressions of the state of clinical instruction at Keio University School of Medicine, primarily for medical students, but also for residents. There is not, therefore, any intention on my part, to portray these as being widely applicable or comprehensive, given the fact that my observations are derived from interactions with a relatively small number of students who were reasonably skilled in understanding English (although a significant proportion were unable to speak it with great fluency). Although I believe that the problems and promise that I discovered reflect those in the system as a whole, I have tried to restrain my impulse to generalize, except insofar as my observations force those generalizations upon me. The observations are, nevertheless, capable of being generalized to teaching practice as a whole at Keio University School of Medicine, because their validity has been verified by both the students themselves as well as the authorities in charge of medical education at Keio University.

My observations on the system of Japanese medical education can be divided into four groups, based on four specific aspects of the interactions I had during my visits, as follows:

1. **The skills of *Japanese Medical Students***
2. **The status of *Bedside Clinical Instruction***
3. **The attitude towards *Clinician-Teachers and Teaching* among the Faculty**
4. **The applicability and promise of *Problem Based Learning***

1. Japanese Medical Students: If I were asked to pick on the one thing that made my trips to Japan the most rewarding experiences I have EVER had as a teacher, my answer without the slightest hesitation would be the incredible young people I had the privilege of getting to know. The number was not large; that was, obviously, because of my own limitation in linguistic skill (I speak no Japanese!). So, *per force*, the only students who could benefit from my presence were those who understood and spoke English. Despite this failing on my part, the enthusiasm and intelligence of those young people was breathtaking. They are as bright and incisive as any of the best students I have encountered over three decades and across three continents, thirstily soaking up instruction like sponges. Having said that, however, I have to say also that, for the most part, (and through no fault of their own!), they would not measure up to even the most average student of comparable chronologic seniority in the US (i.e. 3rd and 4th yr medical students). This is because of several factors:

(a) Lack of Clinical Instruction: Of all the reasons, this is the one that is most glaringly obvious. In essence, it would doom the Japanese medical graduate in the US system. And it explains a curious anomaly that has intrigued me personally for years: despite the vast number of international medical graduates in the US from almost every country in Asia (even discounting the English-conversant countries of South Asia) rare indeed is it to see a Japanese IMG in a residency program in the US.

And the cause of this is not difficult to find: Japanese medical education pays no more than lip service to the development of clinical skills in medical students. Instead, the focus is almost exclusively on the memorization of esoteric details, often without any regard to their relevance to clinical practice (or international medical practice, for that matter!) As a result, the students possess dazzling book knowledge, but have not even the most rudimentary understanding of how to perform an H&P. Basic interviewing skills are absent, there is no appreciation of the value of a structured history with its essential elements, and no one can elicit a physical sign, let alone perform a physical. And yet, ask them what the causes of any physical sign are, and they can rattle off a list as long as your arm!

Case presentations (at least as I understand them) are non-existent. Most students and residents could not present a case to me in even the most rudimentary manner. The exceptions were the three students in the group who had completed a wholly voluntary (and, I am told, extremely expensive!) summer externship at a US hospital. These three performed passably well because of a rare familiarity with case presentation techniques that we consider routine. These three exceptions are important because they give me hope that, with proper instruction in History and Physical Examination skills, most Japanese students will perform creditably.

(b) Passivity: This was the second most glaring failing in the students. It constantly drove me crazy to see these incredibly brilliant and knowledgeable young minds go into limbo because they were taught not to ask ANY questions. I came to realize that it was the Japanese way when I was told by them, in fact, that to ask a question was a sign of disrespect for their teacher! So much so that a couple of students even implied that they were afraid to ask because they would be ridiculed for being too dumb to figure it out for themselves!

What a travesty of the whole concept of teacher and student interaction! Even for me, as someone originally from another Asian culture with a similar tradition of reverential respect for the teacher, this was hard to swallow! So I made sure that, by the time I left, they had learned to open up with me at least. By then, I had them joking with me, and even learning to tease me. I can remember quite clearly the first time that happened, because I felt the room go absolutely still with tension. It was relieved only by my guffaw of laughter

and my congratulating the student for breaking the taboo!

This passivity of Japanese students is a failing that may be much harder to correct than their lack of clinical skills, because it appears to be culturally ingrained. It is inextricably linked to an extremely formal and didactic educational system, which is, from the very beginning (in grade school), one-way and passive, rather than two-way and interactive, and discourages nonconformity. Changing that, in a society that prides itself (and justifiably so) on its incredible record of achievement using its own traditional, home-grown approach, is a formidable undertaking. But if ever there was a society where such fundamental change might be possible, it is Japan, because the very desire to conform can be a powerful sustaining force for change, once reform is given institutional approval. That is my hope.

(c) English speaking skills: These were highly variable, even among those who ''spoke'' English. So my interactions were constrained on occasion by the difficulty in communication. About one-third of my group spoke excellent idiomatic English, although a couple of them did have an accent. Another third spoke it passably well and were able to make themselves understood, although they hesitated at frequent intervals to ''word search''. Most of this subset were also able to understand me without requiring me to repeat myself or slow down. But they had trouble with idiomatic English. The rest had major problems with understanding spoken English, even with my deliberate slowing down of what is ordinarily a quite measured speed of delivery. That cut both ways, because I had trouble understanding their spoken English as well at times. And one of the fluent English speakers would have to translate from Japanese for me. While that could represent a significant handicap for these otherwise stellar students if they were to enter a US residency program, it should be reasonably easy for them to surmount in most cases after a few weeks of immersion in American society.

(d) Medical Terminology: This is not a widespread limitation, but might be potentially a significant handicap in the short term, even for those who speak fluent English. I had trouble at times with terminology and was forced to resort to mime and hand gestures to make them understand the body part, symptom, sign or disease to which I was referring! But overall, these instances were rare enough that they did not pose a problem in communication that was insurmountable.

2. Bedside Clinical Instruction: In a word, NONE! Student after student told me that I was the first person ever to show them ANY physical signs, discuss how to approach the history and physical, instruct them on presentation skills, tell them how to generate a clinical differential diagnosis before they got the results of tests, teach them a priori analysis using pre-test probabilities, or to stress an evidence-based approach to treatment.

This is a problem that stems directly from one fact: there is NO (as in ''zero'') understanding of the concept of training in general internal medicine. Others have described this before,[3,4] and I went to Japan fully forewarned to expect this, but until one actually goes to Japan, it is impossible to comprehend the immensity of this problem. The fact is that every physician in a University Teaching Hospital is a specialist who sees patients exclusively within a very circumscribed sphere of interest, starting from the very first day out of medical school.[15,16] The solitary exception to this otherwise universal rule can be found in ER physicians, who see all-comers.

The specialists I encountered in Keio University Hospital are admittedly highly skilled in their individual specialties, possibly even among the best in the world at what they do. But they are extremely limited in what they can do, because they only see patients with problems that fall under the purview of their own specialized interest from the moment they graduate from medical school. These otherwise highly competent specialists have themselves never been exposed to the concept of general internal medicine. And so, with each successive generation being incapable of providing the next one with a comprehensive view of medicine, the highly specialized system perpetuates its narrowly skewed view of disease processes through successive generations of medical students and teachers. And so it transpires that successive batches of trainees leave their teaching hospitals without any training in clinical skills or concept of general internal medicine, and go into practice to function as.... general internists! Thus, these generalists are burdened forever by not only a lack of clinical skills, but also a mindset bred from an exclusive focus on a subspecialty viewpoint.[17] The consequences for quality of patient care are all too obvious to be even stated here!

A mind-set dedicated exclusively to specialty care breeds another problem: even with the eventual acquisition of clinical skills through experience, the concept of examining the patient as a whole is nonexistent. Thus, in all the time that I was in Japan, I did not encounter a single resident who could present a comprehensive H&P. Case after case presented to me by the residents consisted basically of a statement defining the disease or diagnosis that brought the patient to attention, a rudimentary exam of the system relating to the specialty of that unit, and then an immediate segue to the slew of diagnostic tests that had been performed, all which were exclusively related just to the ''organ label'' that the patient carried!

Lest this be interpreted as nothing more than the most extreme example of sub-specialty rotations in

American tertiary care hospitals, let me clarify. This was not a case of a specialist who recognizes a problem outside his/her area of interest and then says ''I know nothing about this, so let me ask for help''. To the contrary, the ''specialists'' that I encountered probably would not even recognize, let alone have a good understanding of a problem that fell outside their purview. So, you have the terrible situation of a patient I saw the second day I was there with proven congenital heart disease (TGV with pulmonary atresia and a single ventricle), who developed cough, fever and chills, and went to see a pulmonologist (because of the cough!), and was given oral antibiotics for chest congestion. He got steadily worse over the next couple of days, developed diarrhea from the antibiotic and went to a GI expert, who gave him another course of oral antibiotics for gastroenteritis. Yet another week went by before he finally ended up in the ER, critically ill, and thus was seen by the only kind of doctor who sees patients of all stripes. A diagnosis of SBE was finally made and the patient was admitted to the ICU! Needless to say, the patient was still critically ill when I saw him, three weeks after admission.

And that was not even the most egregious example of this terminally specialized system at work. On my last day, I saw a 34 year old patient who had been admitted to the renal unit ten days earlier with IgA nephropathy (creatinine 1.9 and no hypertension) and who developed acute pulmonary edema with hypotension and abrupt worsening of renal failure while in hospital. The case was presented as a diagnostic dilemma for the cause of worsening renal failure. When I asked if the patient had had an MI, my query was met with blank surprise from the residents. When I repeated the question, the possibility was dismissed by the resident because apparently (a) the patient was too young to have an MI, (b) the EKG showed no evidence of MI and (c) the echocardiogram report did not mention an MI. So how could it be an MI? However, when I reviewed the echo report myself, there was clear mention of severe segmental wall-motion abnormalities particularly involving the anterior wall and the septum!

Having said this, I must, however, mention that my interaction with residents (as opposed to the medical students) was relatively limited (to a few hours each day, when I rounded on the wards). These limited interactions may not have been adequate for me to get a true picture of the state of affairs, so any conclusions therefrom must be viewed with a considerable dose of skepticism. In particular, I did not see them outside the ward setting, nor did I have a chance to talk to them without the attending also being present. Thus, I had no opportunity to determine first hand what their experiences were, or to find out their reactions to my presence or to my teaching.

This was probably by design, since the Department of Medical Education, which was hosting my visit, had no jurisdiction over the residents. But the descriptions of resident life given to me by several of the latter, coupled with my own limited observations, lead me to conclude that the resident is almost an indentured slave in the unit in which he/she elects to work after graduation (remembering of course that there is nothing known as ''general internal medicine training'' in Japan). With their future in that specialty dependent exclusively on the chief of the unit, they obviously could not afford to be seen as being disloyal-which would be exactly how any independent interaction with me might be interpreted!

But there is another equally powerful and at times even destructive effect of such a feudal system: it generates incredible pressure to ''impress the boss''. I personally witnessed this destructive force in operation in the case of two of the residents who were required to present showpiece cases to the ''Guest Professor''. They were in a really pitiable state, sweating and shaking visibly, and so close to nervous collapse as to render them almost incapable of articulating a word, even before they started presenting their cases to me. It was clear that they were terrified of making a mistake, and that nothing would relieve them of that terror, no matter how hard I tried to put them at ease. In fairness, some of that may also have been due to the need to present in a foreign language. But I do think that much of it was due to pressure.

3. Clinician-Teachers and Clinical Teaching:
How is Medicine taught at Keio University?: Didactic lectures are the major modality of instruction at Keio University (since there is little or no clinical instruction and no concept of small group discussion or PBL). During my visits there I saw only one attempt to teach students through any other means. That was in the ER, where students are engaged by their teacher in discussions with a distinct PBL flavor, although without the formal case descriptions that go with PBLs. Each student in the group is assigned one acute ER presentation (e.g. chest pain, headache, abdominal pain, shortness of breath etc). Subsequently, the student is expected to give a 10 minute review of the subject (signs and symptoms, differential diagnosis and workup) to the group, while the instructor facilitates and guides the discussions between the students themselves. I cannot begin to describe how laudable this attempt is in a system that does not reward such innovation and actually might be inimical to it.

With this solitary exception, everything else seemed to be taught through lectures. And even those were astonishingly narrow in their focus. The lectures I attended showed me that the faculty views lectures as

vehicles to present research work, rather than to present an overview of the state of the art in clinical medicine or to convey any important concepts, whether those concepts are clinical, pathophysiologic or molecular! And repeated glances around the lecture hall showed also that 90% of the students were asleep at any given time. Even yours truly nodded off, which only goes to show how stupefying didactic lectures can be!

I did experience two exceptions to this rule. The first consisted of a case presentation, followed by a didactic discussion (in English) of the etiology, pathology, clinical features and management of a case of chronic active hepatitis. Although it was a didactic session, the moderator strove actively to engage the students in a discussion, thereby making it as good a didactic teaching session as any I have attended.

The other exception was a CPC session that was put on for my benefit (also in English). It was a case of sudden onset of CHF with chest discomfort in an otherwise healthy male, who turned out to have amyloid heart disease.[12] It was quite well done, because the discussions were highly relevant from a clinical standpoint. But at the risk of repeating myself, I must say that there was little effort made to *teach* the students, who formed 90% of the audience. The faculty in attendance (who obviously knew the case well and were well prepared for it) engaged in soliloquies that did not incorporate any attempt to impart knowledge to the ignorant, or to provide pathophysiologic explanations for the uninitiated.

During a later discussion with a group of students I brought up the fact that both of these sessions were quite stimulating. They were surprisingly unmoved by my enthusiasm, because those sessions seemed to them almost to be aberrations! They raised a legitimate question as to whether they were staged for just my benefit (since both were in English, and therefore almost unheard of). Even though I have no way of dismissing that suspicion, I cannot validate it either. But the very fact that they should suspect that it was so only serves to underline the rarity with which this type of clinical approach to instruction is employed at Keio University School of Medicine.

While the absence of any clinical relevance to most of the lectures was the most glaring of the defects I noted, it was clear also that the teachers I observed seemed to have no sense of (or interest in?) what it was the students really needed to know. Either way, it seemed to me yet another example of the tunnel vision of the super specialist with an exceptional depth of understanding in a limited area! And that is a deficiency that will not change until the concept of a generalist with broad-based understanding of disease receives more widespread acceptance.[13]

That lack seems to be the biggest obstacle to any change in the way medicine is taught in Japan. A close second to it, though, is the lack of recognition of teaching as a scholarly activity in Japan. Research (both grant getting and publication record) is the SOLE determinant of academic success. And if an academic happens to be a clinician, then the only reason for his/her existence is to see patients – until, that is, he or she gets a grant, and can escape purgatory!

It comes, therefore, as no surprise, that several clinicians openly, if somewhat ruefully, declared that they could not teach even if they wanted to, because teaching was identified as an indulgence that wasted valuable clinical time (i.e. hindered revenue generation!). And it seems obvious that the Division Chiefs place little or no value on clinical or teaching activities. Not one of them attends on the wards (the students for the most part had never seen them!), and during my stay there, only two – the chief of ID and the chief of GI – even met me!

Thus, the message from the top seems clear: clinical activities (and teaching) do not count! This must change if clinical instruction is to improve.

Why are Faculty at Keio University Reluctant to Teach?: One must answer this question in order to find solutions to the surprising lack of enthusiasm for clinical instruction that I witnessed time and time again at Keio University Hospital. Research is a vitally important mission of any academic institution, and medical schools that are not at the forefront of medical research should not expect recognition as Institutions of Higher Learning. But a medical school is, first and foremost, a revered place of Higher Learning where future doctors are trained. This means that teaching must be accorded a status that is at least equal with research.

The problem arises when research takes preeminence, and teaching is relegated to second class status. Then, of course, nobody who aspires for academic success would waste their time pursuing excellence in teaching. The result is an institution where the majority of faculty members do not teach. After all, why would anyone waste their careers in such a fruitless and unrewarding pursuit as teaching, when it is not considered a credible academic achievement? What you have then, in my opinion, is not really a Medical School. It deserves to be called nothing more than a Research Center, and faculty members who do not ''profess'' do not deserve the title of ''Professor''!

The purpose of this introduction is to drive home the point that teaching and research are two equally strong pillars of academic achievement, neither one greater or more important than the other, both supporting the academic mission and image of a medical school. The corollary is that teachers, just as much as researchers, are an essential and integral part of the backbone of a Medical School.

This is just not true of Japanese academic institutions, notwithstanding protestations to the contrary.[16] In Japan, promotions policy is based exclusively on research output and faculty who teach are accorded no recognition and given no status. Thus, with research clearly defined as the only ''truly academic'' pursuit, it is understandable that it is downright counterproductive to spend time in anything but research. That breeds the inevitable attitude, so prevalent in Japan, that teaching is not just unnecessary, but actually a wasteful ''non-academic pursuit'' that carries a heavy penalty, because it takes time away from research. No wonder, then, that teaching is relegated to the status of a menial task that falls on the shoulders of inexperienced or disinterested juniors. Since these individuals are themselves under overwhelming pressure to succeed as researchers, have been taught little or not at all during their formative years, and have the unfortunate example of their own mentors to guide them, the outcome is inevitable: teaching receives short shrift.

That teaching still occurs at Keio University Hospital, despite this terrible handicap, is a testament to the selflessness of the few dedicated souls who soldier on without hope of recognition or reward. These individuals, rare as they are, do possess the requisite enthusiasm for teaching, and the right attitude towards student interactions in particular. That attitude is vital in order to encourage interactive learning without the element of intimidation that is almost universal in Japan's highly deferential and hierarchical society. These individuals would be the core group that I would start with if I were looking to change things. If they can be instructed in the basics of teaching physical diagnosis as a course, and they are allowed the ''luxury'' of teaching (i.e. remuneration for time spent), that would be a great starting point for any efforts to change the system. I have no doubt that the students will flock to such a course and then momentum would build for others to follow suit.

Absence of Meaningful Feedback: Yet another major obstacle to meaningful change in medical education in Japan is a failure to get honest, anonymous feedback from students. The tradition of reverence I mentioned earlier as the source of passivity is the limiting factor here too. As one student told me, in Japanese society no teacher can EVER be called bad: it is ALWAYS the student's fault if he/she cannot learn. Add to this the pervasive fear of retribution that exists in a system that makes a resident completely subservient to the Chief, and it ensures that even terrible teachers will get great grades.

4. Problem Based Learning:

I intend to spend considerable space on this one aspect, because this is where I see the greatest hope for the future of medical education in Japan. I must confess that, before I went there, I was not sure at all that the PBL format would be even remotely successful in Japan at this early stage in the process of revamping medical education. But the students were so eager and so insistent about going through a PBL exercise with me, that I agreed very reluctantly (and at almost the last minute) to bring a case for PBL discussion along with me. The short notice I had before departure meant that I had to make do with a case from my own experience, which I put together into PBL format two days before I left for Japan! At that time, of course, I had no idea of the terrible clinical deficiencies I was to encounter, so I had no way of knowing that the case I put together (see Appendix 1) could not have been more suited to exposing those deficiencies: it had a plethora of physical findings, and it crossed the boundaries between multiple specialties (pulmonology, neurology, endocrinology, oncology).

Once I got to Japan, and witnessed the total lack of clinical instruction first hand, I was convinced that my reluctance to do a PBL with the students was going to be justified. Then, at the first (presentation) session, even my worst fears paled into insignificance in the light of the circumstances that confronted me. I was absolutely appalled to find that the discussion group comprised of students from every level in medical school, starting from one in the FIRST YEAR (right out of high school and still two years away from his first exposure to any medically relevant course), seven in the second year (also with no medical knowledge whatsoever), two in the fourth year (exposed to preclinical courses only), and seven with some modicum of clinical exposure, such as it is in Japan (fifth and sixth year)!

I almost felt like calling off the exercise then and there, so daunted was I by the prospect of dealing with (i) such a diverse group of students, (ii) with such vastly differing knowledge bases (iii) and that too, of all things, in a PBL setting. But the enthusiasm on display brooked no denial, and I allowed myself to be carried along by it, against what I thought at that time was my better judgment. So it was with little faith that anything could be achieved from this exercise in futility (or so I thought!) that I let it proceed.

After I asked for volunteers to act as ''reader'' and ''scribe'', the Presentation session began. Quite predictably, there was a total absence of participation from the students. The volunteer ''reader'' simply read through the first page without a pause and then there was total silence. This was understandable, given the fact that none of the students had the foggiest idea about what to do. So I made them read page 1 again, but telling them this time to focus on what was being presented and what they thought was going on with the patient, and most importantly, what the gaps were in

their understanding of what was going on. That started a hesitant ''discussion'' that was anything but a discussion between peers, but rather a series of declarative statements with a tiny question mark at the end, accompanied by a sidelong glance at me! I knew that the students were talking to me, not to each other.

So I moved out of the circle and sat away from the group, exhorting them once again to think for themselves and to discuss their doubts with each other. To my mounting frustration, they seemed unable to shake off their inertia. The passivity that I have commented on earlier was so evident in this setting that I almost gave up in despair, so exhausting was it to wring out each of the first four learning objectives from them. To be honest, there was a complete lack of clinical perspective, even in the seniors, so that they were unable to analyze a case that transgressed the confines of a defined subspecialty! And the ''discussion'' could not even get past the significance or meaning of the plethora of clinical signs!

Then, about three-quarters of the way through the case presentation (on Page 4, see Appendix 1), just as I was beginning to despair, something happened. I have struggled to identify what it was, to no avail, because I still cannot define what happened. But it seemed as though the concept of group learning suddenly, permeated their collective consciousness. It may have been the fact that the only first year student in the group actually spoke up and asked the group (instead of me!), ''Why is the calcium level high?'' And one of the seniors remembered the association between lung cancer and hypercalcemia. That seemed to open the floodgates, and the awesome intellectual curiosity that is habitually suppressed in these marvelously gifted young people found itself with a vengeance!

The last five learning objectives came almost effortlessly, and the ten learning objectives they ''discovered'' quite independently (at least the last 6!) were almost identical to the eight that I had identified to begin with (see Appendix 2)! If ever there was a vindication of the whole PBL concept, this was it.

My only role after that was to sit back and watch the fun as those highly motivated students grabbed the ball and ran off with it. Observing the subsequent discussion, during which they began to talk to each other as a single learning unit, rather than obliquely to me, was one of the most exhilarating experiences of my teaching career. And I had to say very little after that. It was only when it came to assigning the learning objectives that I stepped in and suggested that the two fourth year students be given the two objectives that had to do primarily with anatomic detail, and that the remainder be divided among the 5^{th} and 6^{th} yrs according to preference. Then, everyone went home feeling happy, but also with a quite conspicuous sense of nervous anticipation of the uncharted territory of the Resolution session to come. No one more so than I, on both counts!

I need not have worried, given the high quality of the students I had the pleasure of working with. Simply put, the Resolution session two days later was a smashing success. Only one relatively unimportant factor created a problem, and that too was born of total inexperience on the students' part: no one had any sense of the time it took to present their material. Despite repeated urgings on my part that they should be aware of the passage of time, 100 minutes into the 150 minute session saw only 4 of the 10 objectives completed. So I had to step in and tell them that each subsequent speaker had only 8 minutes to present the five most important points in their material and to take questions from the group on their material! It was stunning once again to see how quickly they got the message. Each of the next 6 speakers got the job done in stellar fashion, curtailing their presentations to just the critical facts in their material. And that left me to be a facilitator in the truest sense of the term, guiding and clarifying when asked, but allowing the discussion to proceed without much interference from me.

I had that luxury because the material presented was of such superlative quality that it required little or no clarification from me! It was comparable to, or possibly even better than, any I have seen in at the University of Pittsburgh! And this from a group that was so inexperienced in this kind of learning and so diverse in medical knowledge and clinical exposure as to daunt even an inveterate Pollyanna like me!

The jubilation I felt at the end was as great as any I have experienced in my teaching career, and I conveyed it to the students. They had every right to be proud of the astounding job they had done, given their total ignorance of the PBL method. Which brings me to a personal revelation that should convince all naysayers and doubters of the PBL method: If there is a better way to teach critical analysis and clinical decision making to medical students, I have not seen it. Not when a group such as mine, as unschooled, unsophisticated, and ignorant as you can get in the science of interactive learning and the art of clinical decision making, could make it into such an exhilarating experience in learning (for them) and teaching (for me). My only abiding disappointment is that not a single Keio University faculty member or resident attended the PBL sessions, despite repeated invitations. Had they been there, not one would have walked away without being impressed by the excitement and enthusiasm for interactive learning that was on display.

On second thoughts, maybe it was good that they did not come! I suspect the session would have ended in dismal failure. I doubt that the students would have felt free – or even dared! – to be spontaneous had they

known their ''sensei'' were watching them and listening to their every word. I have observed that Japanese students are quite intimidated by the very thought of interacting with their teachers (with a few selected exceptions). In such an intensely hierarchical system, it is difficult to imagine that the PBL concept will succeed, because the teacher may be unwilling/unable to forsake the traditional paternalistic role and become a true facilitator of discussion. Even with the best of intentions, the PBL format may well get corrupted into nothing more than a didactic discourse by a lecturer speaking to a small group of mute captive listeners!

I will close this descriptive narrative on this note: my experience gives me enormous hope for the future of medical education in Japan, but it also gives me considerable reason to temper my enthusiasm with doubt. My hope springs from the fact that the materials for resounding success are present, just waiting to be put in appropriate juxtaposition: highly motivated, even brilliant, young minds, thirsting for knowledge and instruction, and a highly skilled faculty with the requisite knowledge and skills.

Unfortunately, the seeds of devastating failure are even more widely prevalent, and are already in ominous juxtaposition: the deeply ingrained and culturally programmed passivity in those young minds, and the contempt and neglect of interactive instruction that seems all pervasive among the faculty, with few exceptions, and within the system itself. It is only if these twin pillars of the current system are brought down simultaneously, that it will be possible to reform the Japanese system of medical education. How to achieve that will be the focus of a succeeding paper.

Summary of Observations Regarding Medical Education at Keio University School of Medicine

The failings in the system of medical education in Japan are not the focus of my observations. My focus is to identify the factors that contribute to the state of medical education as observed by me at Keio University School of Medicine. To this end, I will enumerate the weaknesses and strengths of the system that I feel are relevant to this discussion.

A. Observed Weaknesses:

1. The absence of any concept of a generalist who has a broad-based understanding of disease processes.
2. The absence of any bedside clinical instruction.
3. The absence of any recognition of teaching as a legitimate academic pursuit (and the absence of any rewards for engaging in teaching)
4. The absence of any mechanism for evaluation of teachers in an honest and anonymous manner
5. The overwhelming dependence on passive learning (didactic lecturing) for medical education
6. The absence of clinical relevance in the didactic material (with the exceptions noted)
7. The widespread attitude of deference that leads to unquestioning acceptance by students of all that is or isn't sent their way by seniors
8. The resultant
   a. absence of any sense of participation by students in active and interactive learning
   b. deeply ingrained attitude of passivity and deference in students.

B. Observed Strengths:

1. The quality of the students! What a marvelous resource, and if exploited in the appropriate manner, it could be the engine for long-lasting change.
2. Professor Takahiro Amano as Head of the Department of Medical Education, the perfect person to guide them through the difficult changes to come
3. The will to change as articulated by Dr Amano and endorsed by Dean Kitajima
4. A core group of faculty who I suspect may be willing to become clinician-teachers, given the right incentive
5. The Pittsburgh-Japan Program as a facilitator of change; it can contribute mightily by exposing students in Japan to the wonders of clinical training, and by exposing teachers from Japan to the joy of teaching. A free and frequent exchange of both personnel and ideas will help cultivate the right attitudes for the changes to take place. The best way to have an impact is to send clinical instructors to Japan on a frequent basis, to cover as many institutions as are willing to consider radical changes in their teaching methods. The more that both students and teachers are exposed to the excitement and rewards of bedside clinical instruction, the more likely it is that there will be inculcated a desire to teach in future generations of teachers.

Appendix 1
Problem Based Learning Case
Page 1

A 47 year old male construction worker presents to the emergency room with a 6 week history of coughing up blood. Until today, he has only noted blood-streaked sputum, mainly in the early morning, which he ignored. But today he brought out nearly a quarter cup of blood. He is not experiencing any weakness or lightheadedness. There is no nausea, nor did he experience any similar sensation at the time he coughed up the blood. He has also observed that his voice is more hoarse than usual over the past 2–3 weeks, but he puts it down to a

worsening of his chronic smoker's cough that he has had for most of his adult life.

Review of systems is negative, specifically for any dyspnea, chest pain, weight loss, anorexia, change in bowel habit, abdominal pain, nausea, vomiting, change in stool color. He does not have any weakness or other neurologic complaints.

He has no significant past medical history, is not on any medications, but he confesses to not having seen a doctor for several years.

Social history is significant for a 100 pack-years of smoking (since age 16). He drinks 12–16 beers a week. He works as a construction worker and is not aware of any exposure he may have had to environmental toxins, including asbestos. Family history is significant for heart disease in both parents.

Physical Examination:

Alert and oriented, no distress, but somewhat anxious looking male with central obesity.

Vitals: Pulse 92/min, BP 138/88 mm Hg, no orthostatis, RR 20/min.

Eyes: There is slight ptosis on the right, but lids, sclera, conjunctiva and extraocular movements are all normal. Right pupil is smaller than the left, but light reflex is present in both eyes (direct and consensual). Fundus exam is normal.

ENT: Normal nasal mucosa, oropharynx, tongue and lips.

Neck: No goiter, normal carotids, normal JVP. Single palpable lymph node in the supraclavicular fossa on the right side, 3 cm diameter, non-tender, very firm. Trachea deviated to right.

CV: Normal apical impulse, normal heart sounds, no added sounds, murmurs or rubs.

Chest: Some increase in AP diameter (slightly barrel shaped), increased percussion note across the chest, breath sounds normal except for the right apex, anteriorly, where bronchial breathing is heard, and the right base posteriorly where breath sounds are absent and the percussion note is dull. There are scattered crackles in both lung fields.

Abdomen: Normal palpation, non-tender, no organomegaly, normal bowel sounds.

Extremities: No cyanosis, or edema. Grade 2 clubbing in hands.

Neurologic: Normal cranial nerves, sensory and motor exam. Normal reflexes.

Page 2

Labs: Normal CBC and diff. Normal electrolytes/BUN/Creatinine. Normal LFT's.

CXR: Emphysematous lung fields. Tracheal shift to the right. Right apex shows an area of consolidation with an air bronchogram. There is a pleural effusion on the right.

CT scan of chest and root of neck shows a large mass in the apex of the right lung infiltrating and extending into the soft tissue of the neck. There is enlargement of multiple lymph nodes in the mediastinum; the subcarinal node is >2 cms in diameter. There is a moderate pleural effusion on the right.

Sputum examination shows epithelial cells, and normal respiratory flora on culture. No AFB's seen on direct exam.

Pleural fluid is sanguineous, with >10/100 RBC's, <100 WBC's, but no malignant cells are seen on cytology.

Page 3

Bronchoscopy reveals a large endobronchial mass obstructing the superior bronchus and biopsy of the mass confirms that it is a squamous cell carcinoma.

Page 4

The tumor is not amenable to surgery, and the patient is given palliative radiation therapy. Four months later, he is brought to the ER in a state of confusion and disorientation. His wife says that he was fine until a week ago, when she noticed that he was becoming forgetful, and urinating a lot. He stopped eating a day earlier. PE reveals a cachectic individual, with stertorous breathing, not oriented to time, place or person. Mucos membranes are very dry, the skin turgor is very poor, and vitals show a pulse of 116, regular, with BP ofr 90/60. Neurologic exam is significant only for severe meiosis, enophthalmos and ptosis on the right side. Chest exam shows complete absence of breath sounds on the right.

Labs show H/H of 11/37, WBC of 10.3 K, left shift with 4% bands, BUN of 78, creatinine of 3.1, calcium of 16 (normal 8.5–10.5), Phosphate of 2.9 (nl 3.5–5.0), alk phos of 337 (NL < 150).

Page 5

He is treated with vigorous iv rehydration: 1 liter of normal saline wide open, followed by 0.5 l/hr until pulse and BP normalize. A Foley catheter is placed and intake/output are carefully monitored. Calcium level drops to 13.9 2 hours later. When urine output reaches 3 ml/min (~200 ml/h) he is given 40 mg of furosamide, and IV fluid is adjusted to match output. Calcium level drops 4 hours later to 12.1 and the patient wakes up.

Page 5

Labs drawn in ER at time of presentation show:
PTH level of 3 pg/ml (normal 8–62)
PTHRP level of
25 OH-Vitamin D: 24
1:25 dihydroxy Vitamin D: 66 (normal 10–52)

IV hydration is tapered down over the next 48 hours, but the patient's claium level starts to creep back up to 14.1. The patient is given an IV infusion of pamidronate 1.5 mg/kg over 8 hours. 5 days later his calcium level is 10.3 and the patient is discharged with instructions to follow-up in his oncologist's office for weekly calcium estimations.

Appendix 2
PBL Learning Objectives

1. Discuss the differential diagnosis of hemoptysis
2. Identify the anatomic basis for the ocular findings in the patient
3. Understand the diagnostic work-up of a patient with hemoptysis
4. Differentiate between the different types of lung cancer
5. Discuss the various treatment options for patients with lung cancer, and the indications for radical surgery
6. Identify the relationship between hypercalcemia and malignancy and the different pathophysiologic mechanisms involved in hypercalcemia of malignancy
7. Outline the diagnostic approach to hypercalcemia
8. Outline the treatment of hypercalemia.

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