

On the training of young doctors in China

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Following the economic progress, China is currently performing very well in many areas. Healthcare and medical treatment is probably one of the areas where China is underperforming. Despite the fact that China had 1.8 doctors per 1,000 residents in year 2010 and this number is probably increasing in recent years, leading this numerical figure similar to many other developed countries (1); and in 2012 China spent 5.4% of her gross domestic product (GDP) on health expenditure, not a very bad figure either (2). To allow more international healthcare providers to enter China market can be part of the solutions (3). Very recently, an Indian ophthalmologist in C-MER Dennis Lam Eye Hospital in Shenzhen, Dr. Fairouz Manjandavidq, who specializes in eye surgery, helped the 6-year-old mainland boy who had his eyes scooped out at least partially to regain sight by implanting artificial eyes (4,5). In the meantime, China will remain a resource-poor country *per capita* in the coming future. The limited resource available to each citizen should be used efficiently. China has to train the next generation of native good doctors. Hereby I would like to present some of my personal views on this controversial topic of how to improve the efficiency of training young doctors in China.

(I) To recruit good students into medical schools. Medical students should be keen learners through their life as medical science is continuously progressing and evolving. It is highly desirable that a minimum standard is set for each year's enrollment. In some cases it would be better to keep seats vacant rather than decrease the standards in order to fill up the annual intake quota. For medical student enrolment, some moral assessments should be

considered (6). There are some psychological tools to do this; or good recommendation for the students should be obtained from secondary school teachers. Doctors are respected; high moral standard is also expected of them in return.

(II) Undergraduate medical curriculum should be standardized across the country. In most of the countries worldwide undergraduate medical curriculum lasts 6 years. USA and Canada has the unique system which requires an undergraduate degree in order to be enrolled in medical school which last mostly 4 years but can also be 3 years (or even 2 years occasionally). In the meantime this undergraduate degree can be on any subjects including English literature or history. The main reason behind is that the North Americans want the medicine study candidates have a clear vision that they do want to be a medical doctor which will require a lots of life commitments, i.e., they want the candidates to be more matured when they make the career choice. On the other hand, with the 4 plus 4 MD education, there is no evidence to suggest that American doctors generally outperform their European colleagues in skills. Health care quality in the US is also not notably superior to some of the far less expensive systems in other countries (7). In the year of 2012 Germany spent 11.3% of her GDP on health expenditure, Japan spent 10.1%, while USA spent a staggering of 17.9% (2). Fortunately, USA has strong industries in pharmaceuticals and medical devices; so much cost is absorbed internally. Since China is a resource-poor country *per capita*, it is probably not cost-effective to

popularize long duration curriculum such as the 8-year program.

- (III) Medical school is primary the place to train future doctors, clinical skills and analytical thinking should be taught through the years (6,8,9). Problem-based-learning (PBL) should be used frequently (8,9). For those who are truly also interested in fundamental research, a double-major program can be offered which may lead to for example a bachelor degree in medicine plus a bachelor degree in biochemistry. In Chinese University of Hong Kong students are taught to read basic radiological images during the first year, right after they learnt gross anatomy.
- (IV) Due to the unique features of medical education as compared with other disciplines such as humanities and sciences, medical college is better to be administered semi-independently or independently. For example the First Moscow State Medical University became an independent university from the Moscow State University in 1918; and the Medical University of Vienna became an independent university from the University of Vienna since 2004. In Austria the independence of medical schools from the structure of “general” universities was part of a larger reform of the Austrian university system enacted by the Schüssel government in 2003. Research collaboration is often more facilitated by geographical closeness and cultural closeness rather than being under a single administrative umbrella.
- (V) English is the most widely used language in medical community worldwide, and the state-of-the-art medical knowledge is usually first reported and shared in English language. A good command of English allow acquisition of medical advances more efficiently, thereby providing most updated caring for patients. However, our recently survey carried out via DXY website showed overall Chinese doctors’ command of English remains to be much improved (10). It may not be essential that every Chinese doctor is able to speak or write English, but Chinese doctors should be able to read medical English literature efficiently. Many classical text books are available at a reduced price for less developed countries.
- (VI) Residential clinical skill training is probably the most difficult one to tackle in current China. In USA the residential training for Radiology

specialty is 4 years. After 4 years’ training, most of the trainees become fairly experienced radiologists. However, in China the 3-year professional master degree scheme has been in place for many years with the results seen as unsatisfactory. Recently compulsory 3-year residential training scheme is being introduced. It remains unknown whether this scheme will outperform the professional degree scheme. If there is no senior supervisor responsible for the trainees, training time may be poorly utilized. Some of the established doctors might not be in hurry to coach the next generation potential competitors, particularly in surgical specialties. For some specialties such as pathology, radiology, and some internal medicine specialties, trainees can do lots of self-studies; particularly nowadays many online materials including videos are available. For surgical specialties, probably some special surgical skill centers can be established, surgical trainees can attend these centers for 2-3 months every years. In these surgical skill centers some sophisticated computer simulation tools and animal models under proper ethics guidance can be used (11-14).

- (VII) Strict specialty exit training examination should be setup. In Hong Kong, trainees have to take the UK specialist examinations. Many doctors in India also do the same. Language will be a significant barrier for Chinese doctors. The possibility of setup some kinds of international standard specialist examinations but conducted in Chinese language can be explored.
- (VIII) Medical specialists’ clinical performance should be monitored. Regretful events such as misdiagnosis and surgical complication do happen occasionally (and also inevitably), maybe due to technical limitations or human-errors, no matter how careful a doctor is. However, these events have to be within the limit of certain percentage. When the frequency of errors occurs above some recognised thresholds, the involved doctor may need to be re-trained in some areas.
- (IX) The cost-effectiveness of Cuba’s medical care system is worthy being carefully looked at. While some controversies remain, Cuba’s medical care system is generally well recognized for its high efficiency (15-17). In 1976, Cuba’s healthcare program was enshrined in Article 50 of the revised Cuban constitution which states “everyone has

the right to health protection and care. The state guarantees this right by providing free medical and hospital care by means of the installations of the rural medical service network, polyclinics, hospitals, preventative and specialized treatment centers; by providing free dental care; by promoting the health publicity campaigns, health education, regular medical examinations, general vaccinations and other measures to prevent the outbreak of disease" (18). Despite limited resources and the economic sanctions imposed by US, Cuba has managed to guarantee access to healthcare for all segments of the population. In 2000, Secretary General of the United Nations Kofi Annan stated that "Cuba demonstrates how much nations can do with the resources they have if they focus on the right priorities—health, education, and literacy" (19,20).

In 2010, Cuba has 6.7 doctors per 1,000 residents compared with 2.4 doctors of USA. Cuba has one of the highest life expectancy rates in the region, with the average citizen living to 78.05 years old. As of 2012, infant mortality in Cuba was 4.83 deaths per 1,000 live births compared with 6.0 for the United States. The computerized Cuba's Data Transmission Network and Health Website (INFOMED) allow access to all units the national health system, therefore to maintain quality health service, increase information exchange, and also facilitate research. In the R&D front, as examples, in the 1980s Cuban scientists developed a vaccine against a strain of bacterial meningitis B which eliminated what had been a serious disease on the island and this vaccine is now used throughout the Americas (21). Epidermal growth factor receptor inhibitor nimotuzumab, a monoclonal antibody used to treat cancer was developed by Cuba's Center of Molecular Immunology (22). In 2007, the Cuba IPV Study Collaborative Group reported that inactivated poliovirus vaccine was effective in vaccinating children in tropical conditions (23). This is important because countries with high incidence of polio have been using live oral poliovirus vaccine. During her recent visit to Havana in July of 2014, Margaret Chan, Director-General of the World Health Organization (WHO), impressed by the country's achievements in this field, praised the Cuban health care system: "Cuba is the only country that has a health care system closely linked to

research and development". She also praised "the efforts of the country's leadership for having made health an essential pillar of development" (24). In praising Cuba, the WHO stresses that it is possible for third world countries with limited resources to implement an efficient health care system and provide all segments of the population with social protection.

Cuba also trains young physicians worldwide in its Latin American School of Medicine and provided numerous medical assistance to other countries. Unlike some foreign aid programs which assume that some political benefits will come in return, most of the countries which have been assisted by Cuba, for example, Ethiopia, Gambia, Haiti, have nothing to offer (15).

China lies slightly ahead of Cuba in terms of *per capita* nominal GDP (25). I believe some lessons can be learned from the Cuba experience. In Cuba doctors are not well paid, but they are respected. Doctors are also called *baiyi tianshi* (angles in white coat) in China. Doctors, helped by the government, shall make efforts to retain this noble title of *baiyi tianshi*.

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