

# Selection of Medical Students in Singapore: A Historical Perspective

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## Abstract

The selection of medical students in Singapore has been a contentious issue for more than 140 years. Initially, students were selected for Madras Medical College, the traditional source for medical officers in early Singapore, by a combination of an examination as well as an observed preceptorship at the General Hospital. With the establishment of the medical school in Singapore in 1905, the selection criteria have been progressively refined over the years. These have included a baseline academic threshold, linguistic competence and performance at an interview. In the past, other criteria such as gender and political suitability were important but at the present, only hepatitis B virologic status is a limiting factor for otherwise qualified applicants. Singapore's Ministry of Health reports an attrition rate of 10% from our medical school. This poses a challenge as there are far more qualified applicants for medical school in Singapore than there are places. This is a worldwide problem and locally, attempts are being made to further refine the admission process to ensure that the community as a whole is best served by the future doctors we select.

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## Introduction

The selection of medical students is always a controversial issue. History is an even more controversial subject. When Professor Cheah asked me to write about the history of the selection of medical students in Singapore, I knew that I was stepping into a minefield. I would thus like to state at the onset that all these views are entirely my own interpretation of the available data. As will soon be obvious, none of the opinions or conclusions in this text represents any official point of view and I hope that I do not cause too much offence.

## Pre-Straits Settlements Medical School [i.e., Pre-National University of Singapore (NUS)]

Lee<sup>1</sup> traces the origin of formal medical education in Singapore to a government notification published in 1869. The gazette stated that "*candidates for medical education at the Medical College in Madras were to be selected after an examination to test their educational qualifications and a 1- to 2-year course of hospital training at the General Hospital, Singapore during which they would be tested every three months by a formal examination.*" Following this, they were to be "*sent to Madras for a 3-year Collegiate*

*Medical Course and then on return were appointed Apothecaries and were required to serve the Straits Government for 15 years or if they left the service early to repay the government the whole of the expenditure incurred*", indicating that "bond-age" for scholars in Singapore has a long and distinguished tradition. Candidates were required to be between 16 and 19 years of age, with certificates of parentage, of age, with testimonials of character and respectability and were subject to a physical fitness examination. The examination conducted at Raffles Institution consisted of (1) an exercise in dictation and handwriting, (2) a colloquial examination of either Hindustani or Malay, (3) the leading facts of Ancient and Modern History, (4) General Geography, (5) Arithmetic, Vulgar and Decimal Fractions and Proportion, (6) Algebra and (7) the first book of Euclid. Successful candidates were sent to Madras Medical College, the traditional source for most medical graduates for much of the first century of Singapore's existence as a modern city.

Of course, this situation of dependence on foreign trained physicians was not tolerated for long and as I am sure will be detailed by many other contributors to this journal, a petition went to the authorities led by the visionary

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businessman Tan Jiak Kim. This called for the establishment of the Straits Settlements Medical School. While the business community led the funding and the motivation for the establishment of the medical school, they left the professional matters, including the selection of medical students, in the hands of the colonial educational and medical authorities. A first-person account of the selection of the first batch of medical students for what was to become the National University of Singapore is preserved in the words of the first medical student selected, Dr EW deCruz.<sup>2</sup> Thirty years ago, at the age of 84, he wrote, “*While I was in the scholarship class of St Joseph’s Institution, Singapore, I saw an advertisement in the Singapore Free Press which announced the proposal to open a medical school in Singapore and invited applicants. It was the first week of February 1905 ... I was attracted by the idea of studying medicine in my hometown, especially so when my elder brother had gone on to Madras to take up medicine. So I approached my director Rev Brother Michael for a testimonial but he did not like the idea and therefore would not give me a testimonial. He had a more ambitious plan for me. He thought I had a better chance of winning the Queen’s Scholarship and going to England for higher studies. Undeterred, I went to beard Mr Hullett, the Director of Education, in his den. He was regarded as a strict man, but I plucked up enough courage to explain the circumstances to him and he finally gave me a testimonial ... I became the first applicant admitted to the Singapore Medical School.*”

### Academic Threshold

It was recognised from the very outset that there had to be a baseline academic threshold for the rigorous discipline of medical school. The earliest official documentation that I could find<sup>3</sup> stated that in 1908, all students were required to have passed Junior Cambridge English Composition, Geography and Mathematics. For Scholarship students, in addition, they had to have passed not more than three of Latin, Elementary Experimental Science, French, German, English History, Chinese, Tamil or Malay. In 1912,<sup>4</sup> presumably with the improved educational standards all round and the increased popularity of the medical school following the first batch of graduands, the level of achievement required was raised to the Senior Cambridge Examination. Around the same time, the requirement for Geography was dropped and the compulsory subjects were English, Mathematics, Latin and a Modern Language, which could include French, German, Malay, Chinese, Tamil or Hindustani.

### Second Language

The formal requirement for a second language for entry into the medical school in Singapore dates back to 1914 and

1915. However, as early as 1910,<sup>5</sup> “Colloquial Malay” was a requirement in 1910 for entrants into the medical school. Those of us who round on wards in our hospitals and witness the inability of many of our housestaff to communicate with the elderly patients might wish that this requirement (probably also with spoken Hokkien) had been retained. With all the recent discussions on the role of second language in University entry, it is worth remembering that today, as was the rule almost a century ago, a pass in the second language is still mandatory for entry into medical school with good reason.

In effect, the last major change to the academic threshold for admission to medical school in Singapore was made in 1923 when the preliminary examination was scrapped.<sup>6</sup> In its place, the Cambridge Senior Local Examinations (the predecessors of the A-level examinations) or the London matriculation or the Hong Kong matriculation were accepted instead. Compulsory subjects included English, Mathematics, a language other than English, and one or more from History, Geography, Physical Science, Natural Science, Advanced Mathematics, Latin, Greek, Hebrew, French, German, Urdu, Malay, Tamil, Chinese or another recognised language. Compulsory Latin was discontinued. With the addition of the requirement for A-level Chemistry, which was introduced in the 1960s, the baseline academic threshold has remained essentially the same for the last 80 years. Although the weight given to the different elements of language, mathematics and natural sciences has varied, the A-levels have been the portal of entry into medical school for as long as anyone can remember. This current academic year, NUS has been given some degree of flexibility for 10% of the applicants, who are selected on the basis of exceptional ability in a “non-A-level” field of achievement. The performance of these individuals is being monitored and it will be interesting to see if they do any better or worse than those selected through the 80-year-old A-level route. This is a welcome change and hopefully more medical students will be selected by assessment of a broader pattern of achievement and potential.

### Talent Spread

The last major reform effort to utilise criteria other than performance in the GCE A-level examinations took place 25 years ago. Interestingly, the motivation was not so much concern for the kind of students selected for medical school but rather the perception that top students “disproportionately” went into Medicine at the expense of the other disciplines, thereby adversely affecting the economic and technological development of Singapore. Of course, at that time, Medicine was perceived as a “money-losing” proposition, not one to be encouraged in pragmatic Singapore; this was before biotechnology and the “Life Sciences” (as biology has come to be known) were to

become the “fourth pillar” of the economy. Whatever the motivation, thoughtful reforms and challenges to the status quo are always beneficial, although not always in the way they are planned.

In order to “spread” the “talent” in all disciplines at the University of Singapore, a decision was made in 1978/79 to place a “cap” of not more than 15% of the best A-level candidates (i.e., those scoring between 60 and 64 points) to be selected for Medicine and Dentistry. All candidates shortlisted were also required to take the preselection test known as the SUMET (Singapore University Medical Entrance Test) and appear before an interview panel.<sup>7</sup> This is the first time that an interview was made compulsory in recent times and it was initially conducted by a select panel of 3 senior physicians or dentists, including representatives from the Ministry of Health (MOH) hospitals as well as the University. Last year, the interview panels were broadened considerably to include junior doctors, senior nurses and senior medical students. Anecdotally, this seems to have worked well, although correlation of the interview scores of the various diverse interview teams and the students’ subsequent performance in medical school and as house officers will obviously not be available for many years. Last year, also, the students were subjected to an essay assignment, which they had to complete on the spot. Again, we await an analysis of the success of this method of discriminating among the huge pool of qualified candidates for our medical school. The whole issue of the “talent spread”, which was the original reason for introducing a diversity of methods in the selection of medical students, has become moot as huge numbers of Singapore students regularly exceed the threshold to be considered in the “talent” pool for redistribution and there are more than enough to go around the different faculties and scholarship-awarding bodies. One school alone has 593 out of 813 or 67% of their students scoring 3 distinctions or higher.<sup>8</sup>

### Vocational Assessment

As part of the reforms of the selection process, in 1980, the MOH recommended that potential medical students be exposed to ward work for 4 to 8 weeks to experience “the realities of a medical career”. The idea was that those who discovered that they were unsuited to medicine could choose alternative careers. Theoretically, this is a very attractive idea. Unfortunately, the very first year it was implemented, “*it was realized that the scheme needed to be modified significantly.*”<sup>9</sup>

Students were required to carry out the “*menial tasks of nursing care*”.<sup>10</sup> Although this was initially designed to be an additional discriminatory tool for the admission process, it quickly became apparent that it was impossible to standardise and administer it in a fair and reproducible

manner. It was then transformed into a “self-weeding” process by which students themselves could elect not to do medicine as a career if they found exposure to sick patients in the wards too “off-putting”.

Vocational assessment was still included in the requirements for medical students up to academic year 1985/86.<sup>11</sup> We do not have a published analysis of the effectiveness of this exposure for pre-medical students, although anecdotal experience and the termination of the experiment would suggest that it was largely ineffective as a means of selecting potential doctors from bright 18-year-olds.

I do not know of any medical school anywhere in the world which has perfected a situational method of assessment of the suitability of an 18-year-old who has just completed his/her A-levels for taking up a career in medicine. This does not mean we should give up trying and there should be a number of interesting attempts in the near future as medical schools in Singapore and abroad seek to improve the relevance and accuracy of the selection process.

### Gender

Singaporeans can be justly proud of the fact that 2 women graduated from the second graduating class of the Straits Settlements Medical School in 1911 not long after the first female medical graduates in the West. In 1979, a cap was introduced to limit the female medical student intake to one-third. According to the MOH,<sup>12</sup> at that time, the attrition rate of female doctors ranged from 16% to 19%, compared to 5% to 8% for male doctors. By 2002, MOH statistics<sup>12</sup> showed that the attrition rate of male doctors had risen to 9% while that for female doctors had “dropped” to 14%, and the quota was therefore relaxed. Also, because of “feedback from the public sector healthcare clusters” that there was “no significant problem in deploying female doctors nowadays”,<sup>13</sup> the decision to abolish the quota was made. This highly popular decision served to rectify the anomaly in which “less qualified” male students were preferentially admitted to NUS Medical School over “more qualified” female students, many of whom went overseas to study medicine and never returned to Singapore. It is a tribute to the perseverance of the Association of Women Doctors, among other concerned individuals, that this policy was finally altered.

### Ethnicity

Singaporeans can be justly proud, too, that ethnicity has never been a major criteria for selection. Indeed, in a review of the first 45 years of the King Edward VII College of Medicine in Singapore, just before the creation of the University of Malaya,<sup>14</sup> Professor Faris, Dean of the Medical School reported the breakdown of graduates as, 154 (37%)

Chinese, 165 (40%) Indians, 62 (15%) Eurasians, 29 (7%) Malays, 4 Japanese, 2 Jews, 1 European, 384 men, 33 women, 197 in government service and 220 in private practice. The ethnic distribution is a striking testimony to the drive and commitment to education of the Indian community, a community that has never made up more than 10% of the population of Singapore. Of course, this “imbalance” was soon corrected for a variety of reasons.

### Virological Status

Since the last decade, all candidates for the medical course have been required to provide proof that they have satisfactorily completed a course of immunisation against hepatitis B, or in the case of non-responders, that they are not infectious.<sup>15</sup> This policy is in line with the somewhat controversial policy of the United Kingdom,<sup>16</sup> which restricts medical school entry to individuals who are positive for the hepatitis B surface antigen, regardless of their e antigen status, while allowing human immunodeficiency virus (HIV)- and hepatitis C virus (HCV)-infected healthcare workers to continue working. It is opposed to the policies of the United States Centers for Disease Control and Prevention which allow healthcare workers infected with hepatitis B, C and HIV to continue working with the appropriate precautions and counselling.<sup>17</sup> As there has never been a transmission of hepatitis B from a non-surgeon or dentist, and hepatitis C has been transmitted more frequently from provider to patient,<sup>18</sup> one wonders if the UK regulations are not so much designed to protect the patients as to provide another barrier to healthcare workers from the former colonies. Hopefully, this will change in due course, both here and in the UK.

### Political Correctness

From the early 1960s, medical students, like all students at the University of Singapore, were required to produce a “*certificate of political suitability*”, presumably to exclude students of an extremist persuasion, prior to enrolment. Dr BR Sreenivasan, first Asian Vice-Chancellor of the University of Singapore and founder President of the Singapore Medical Association resigned from the University in protest on 4 November 1963 rather than enforce this regulation. He is quoted by his son as retorting to evidence of student involvement with communists by saying, “*I am a Vice-Chancellor, not a policeman.*”<sup>19</sup>

The requirement for the certificate of suitability persisted through 1979. In the “*Instructions to Candidates Applying for Admission 1978-9*”, Item 1 states, “*All persons entering the University of Singapore or Nanyang University must have a certificate of suitability issued by the Singapore Ministry of Education.*”<sup>20</sup> This requirement disappeared in the 1979-80 handbook. Presumably, Singaporean students are now all politically suitable or the administration is now

less concerned with political correctness than with education, which would be a good thing.

### Role of Parents and Schools

Ultimately, the selection of medical students from fresh 18-year-old A-level graduates is a Herculean task. Medical schools in other parts of the world have attempted a variety of methods of trying to select medical students while recognising that the process can never be perfect.<sup>21</sup> The leading medical bodies in the United States have identified 6 core competencies which are required of the products of medical education, but these can essentially be crystallised into 2 broad areas of “knowing” and “being”, or medical science and medical professionalism. For nearly a hundred years, we have assumed that success in the A-level exams provides a good chance of success at attaining the “knowing” parts of medical education. We have also assumed that the “being” parts are acquired through osmosis, by following in the footsteps of great clinicians – the Ransomes, the Seah Cheng Siangs, the Danarajs and the Chan Heng Leongs of the past. After the flurry of reforms of the late 1970s to 1980, there are once again attempts to reform the process of selecting medical students. One inescapable fact remains: in Singapore, there are always more qualified applicants than there are places. The traditional approach has been to select a few on the basis of academic results, interviews or other tools and leave the rest to seek medical education overseas if they can afford it, or to end up in some other profession. Data from the Singapore Medical Council<sup>22</sup> suggest that the vast majority of Singaporeans who go overseas to do medicine do not return (at least not in the early pre-registration years). It is unclear how long this brain drain will be allowed to continue. At the same time, serious questions are raised about the equity of a system which allows the wealthy to pursue the career of their choice while resigning those with limited resources to other options. The recent experience of a neighbouring country, where every qualified medical student was guaranteed a place in medical school either locally or overseas, is interesting but probably will be dismissed by more practical Singaporeans.

So, we are faced with a dilemma. On the one hand, we have an attrition rate, according to the MOH,<sup>12</sup> of more than 10% of those who have completed medical school in Singapore; on the other hand, we have large numbers of qualified applicants who have to be turned away on the basis of new and as yet unvalidated methods during the short window that the Ministry of Defence allows the medical school to complete the entire selection process for medical school. Personally, I think that the responsibility is too large for any individual or any one committee in the medical school. I think we need a concerted effort from parents, teachers in junior colleges and, most importantly,

the students themselves. As the handbook for prospective applicants for the King Edward VII Medical School put it in 1923, “*No profession requires a more exacting course of training than that of medicine. And only those with a suitable type of mental equipment may expect to attain success ... Many of these attributes are naturally still latent at the period when the candidate matriculates. But even at that early period, it requires little discernment on the part of schoolmasters and parents ... to assess the fitness of a candidate for entry to the medical course. Unless a student is endowed with the “medical mind” (presumably those qualities which would make a good doctor), it is incumbent upon parents and teachers to divert his energies to some other form of activity.*”<sup>23</sup> That would require a radical change in the entire education system, including a far greater attention to career counselling at the secondary school and junior college level, as well as a far greater range of career choices than are currently available to many of our young people. Alternatively, we could perhaps move towards a graduate medical education programme, which the United States has had for nearly a century, and which the Australians are gradually moving towards. The current wave of reforms in the education system, from primary school through junior college, gives me grounds for enthusiasm that the hopes of our predecessors can become a reality in the near future.

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