

The Development of Postgraduate Training Programmes in Singapore?

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Abstract

Singapore is a small country compared to Pakistan. Being an urban modern developed nation with a high population density, adequate doctors (& specialists), and good infrastructure, it has one medical school enrolling 200 students annually, one Graduate School of Medical Studies (GSMS) responsible for entry postgraduate examinations (the MMed) and one Academy of Medicine (AM) responsible (jointly with the Graduate School) for exit certification /examinations (FAMS) into 35 specialties. There is also one College of Family Physicians with a significant role in the training of Family Physicians jointly with the Graduate School. The Aga Khan University runs 14 residency (3 to 4 years) and 2 fellowship programmes. It has the College of Physicians and Surgeons of Pakistan, which awards fellowships to trained postgraduate doctors.

Formal postgraduate education in Singapore began in the 1960s with the help of the Australasian Royal Colleges. The Graduate School of Medical Studies was born in 1969 to conduct Master of Medicine courses and examinations, either alone or jointly with overseas colleges. Over the years up till 1996, the MMed covered 11 disciplines. Programmes are set up based on local needs for a specialty, subspecialty, skill or expertise. Both the GSMS and AM have heavy responsibilities under the Specialists Accreditation Board (SAB) of the Ministry of Health, to administrate the 35 Specialist Training Committees. Syllabus, log books, registers, supervisors, mentors, interviews and exit certification /examinations are essential components of the specialist training programmes which last 6 to 7 years.

As new specialties and subspecialties develop internationally, they will be introduced locally at the appropriate time. Through the local training programmes, doctors become specialists in their early thirties. The challenge is to develop systems to ensure that for the next 30 years of their practice, they remain up-to-date, competent and effective doctors.

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Introduction-Singapore: A Small Country

Singapore, a small island off the southern tip of Peninsular Malaysia, was founded by Sir Stamford Raffles of the East India Company of Great Britain in 1819. It remained a British colony until the Japanese invasion and occupation of the land from February 1942 until 1945. It was returned to the British who then ruled it till partial independence was granted to it in 1959. Full independence as a part of Malaysia in 1963 was followed in 1965 by separate independence as a nation city-state. Today, there is a population of some 3.5 million living on 625 square km of land. It is a modern developed nation boasting a US\$20,415 per capita income. Pakistan is by comparison a huge country.

Medical Facilities and Doctors

There are some 5000 doctors who are western-trained practising in Singapore which has no rural countryside

and is best described as an urban community. About 50% of the doctors are in the private sector, the rest being employed by the public sector consisting of the government and restructured hospitals and institutions (including polyclinics) and academic staff of the National University of Singapore (NUS) with its Medical Faculty, the only one in Singapore. About 2000 doctors are specialists. There are 7 public and restructured hospitals and another 7 private hospitals giving some 5300 public beds (78%) and 1500 private beds (22%) for acute medical care. In addition, there are 3112 psychiatric beds. Primary care in the community is provided for by 16 government polyclinics dotted throughout the island and over 1000 private general practitioners clinics, many of them solo practices.

It takes 5 years to train a doctor through medical school at the National University of Singapore, which has an intake of 200 students per year. The University also

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awards the Master of Medicine (M Med) degree to doctors who undertake postgraduate examinations. This degree is considered as the entry qualification into further training, on completion of which the Academy of Medicine awards the successful doctor the Fellowship of the Academy of Medicine, Singapore (FAMS) in one of 35 specialties currently recognised in Singapore.

Postgraduate Medical Education and Training

Medical education is a lifelong process. All new graduates, following their internship, work in the medical service of the government or the university for at least 5 years. After the first year of service, they can elect to embark on formal training either as a specialist or in family practice. The first period of training is called Basic Training and is for 3 years, leading up to and including the acquisition of the relevant postgraduate medical qualification (usually the M Med or its equivalent). The next phase of structured training is called Advanced Training and is for 3 to 4 years depending on the Specialty and concludes with the exit certification and the FAMS (or equivalent). Thereafter, the doctor may apply to be on the Specialist Register of the Singapore Medical Council which today recognises 35 different specialties.

The Graduate School of Medical Studies, The Academy of Medicine and The College of Family Physicians'

The Graduate School of Medical Studies (GSMS) is administered by a Board comprising representatives from the Faculty of Medicine of the NUS, the Academy of Medicine (AM) and the Ministry of Health (MOH). The school administers the Master of Medicine (M Med) examinations, which correspond to membership or fellowship examinations of the United Kingdom (UK) or Australasian Royal Colleges. To ensure that high and corresponding standards of examinations are maintained, external examiners from the Royal Colleges are appointed. Since the establishment of the school in 1970, more than 1500 doctors have successfully completed these higher examinations.²

The Academy of Medicine, founded in 1957, is the professional corporate body for medical and dental specialists in Singapore. The Academy is patterned after the Royal Colleges in the UK and Australia, but unlike these colleges, which are responsible for individual disciplines, this body embraces all specialties. Thus, the Academy includes all specialists in Singapore whether they be in the government services, the university or in the private sector. Its mission is advancing the art and science of medicine, maintaining the highest standards of professional and clinical practice and improving postgraduate education and training. Fellowship requirements are stringent and include completion of specialist training which takes at least 8 years after graduation.

The College of Family Physicians was founded in 1971

as the professional corporate body for practitioners of family medicine in Singapore. It works closely with the Ministry of Health and the Department of Community, Occupational & Family Medicine of the NUS. It is responsible for setting and maintaining standards of family practice. The M Med (Fam Med) is the recognised postgraduate qualification but the Family Physician is not recognised as a Specialist by the Singapore Medical Council's Specialist Register.

The Singapore Medical Council

The Singapore Medical Council (SMC) is a statutory body given power under the Medical Registration Act. Besides being a disciplinary body, it is concerned with medical registration of doctors of which there are two types today. The first is the Register of Medical Practitioners defining who among the western-trained doctors are eligible to practise medicine in Singapore. The second and more recent register is the Register of Specialists which came with effect only in 1998 and today recognizes 35 specialties.

Training Programmes at the Aga Khan University? A Comparison with Singapore

The Aga Khan University (AKU) was founded in 1983 as a private university and offers residency programmes since 1986 and fellowship programmes since 1996. The NUS began in 1905 as the College of Medicine and is the only medical school in the country. It is a public institution. Basic training programmes started in 1969 when the School of Postgraduate Medical Studies was born and the first M Med examinations were held in 1970. In 1998, the name was changed to Graduate School of Medical Studies (GSMS). Advanced training programmes were formally introduced in 1992 by both the Academy of Medicine and the GSMS working together.

The selection process for residents at the AKU starts after a year of internship when doctors sit a multiple-choice question test and are interviewed in September before starting residency in October the same year. In Singapore, basic trainees start 2 years postgraduation, after a year of internship and another year as medical officer. The interview is in February and the training begins in May the same year. On successful completion of training, the doctors are awarded certificates by the AKU and the Fellowship of the College of Physicians and Surgeons of Pakistan. In Singapore, basic trainees pass the M Med and move onto advanced training, culminating with the FAMS.

The AKU offers fourteen residency programmes and two fellowship programmes. The residency programmes are in Anaesthesia / Intensive Care, Community Medicine, Family Medicine, General Surgery, Internal Medicine, Neurology, Obstetrics & Gynaecology, Orthopaedic Surgery, Pathology, Paediatrics, Radiology, ENT and

TABLE I: COMPARISON OF RESIDENCY TRAINING PROGRAMMES

	Aga Khan University	Singapore
Anaesthesia / Intensive Care	3 years 4th year-advance training 6 new residents yearly	3 years basic 3 years-advance training 9
Community Medicine	4 years	3 + 3 years
Family Medicine	3 years ± 4th year (normal) 4 per year	3 + 3 years 31
General Surgery	5 years Chief Resident 8 per year	3 + 3 years 26 (basic trainees)
conjoint examination with RCS Edinburgh, Glasgow		
Internal Medicine	3 years MRCP Pt II 11 per year	3 + 3 years M Med/MRCP (UK) Examination 31 (basic trainees)
Neurology	3 years 2 per year	only as adv trng 4 per year
O & G	4 years log book 3 per year	3 + 3 years 9 per year
recognised by RCOG / RACOG		
Orthopaedic	4 years 2 per year FRCS	3-4 year advance training 3 per year FRCSE (Orth)
Pathology	4 years 3 per year	5 + 1 years 1 per year
Paediatrics	3 years 7 per year MRCP	3 + 3 years 6 per year M Med/MRCP (UK)
Radiology	4 years 1 every other year	3 + 3 years 2 per year
Urology	4 years 1 every other year	3 + 3 years 2 per year
Others —	ENT Ophthalmology	

RCS: Royal College of Surgeon; RCOG: Royal College of Obstetrics & Gynaecologists; RACOG: Royal Australasian College of Obstetrics & Gynaecologists

Ophthalmology. The two post-residency fellowship programmes are in Adult Cardiology and Paediatric Surgery. Tables I and II show the comparative features between the AKU and Singapore programmes. Note that at the AKU, Neurology and Orthopaedic Surgery are residency programmes of 3 and 4 years respectively post MBBS without the need to go through Internal Medicine and General Surgery respectively in the first instance.

Specialist Certification of Training

i. Specialist Accreditation Board (SAB)

Formed under the Medical Registration Act of 1997,

TABLE II: COMPARISON OF POST-RESIDENCY TRAINING PROGRAMMES

	Aga Khan University	Singapore
Post- Residency		
1. Adult Cardiology	3 years Int Med + 3 years Cardiology American College of Cardiology Written exams - 2nd year 3rd year 1-2 per year	3 years Int Med + 3 years Cardiology + 4th year Subspecialty Exit Exam 4 per year
2. Paediatric Surgery	4 years General Surgery + 3 years Paed Surgery North American model 1 every other year CCST FCPS - II	3 years General Surgery + 3 years Paed Surgery British model 1 per year Exit Exam FAMS
Questions:	What is the role of CPS in Pakistan? What does "programme being recognised by the CPS of Pakistan" mean? What is the role of the PDMC?	

CCST: Certificate of Completion of Specialist Training;

FCPS: Fellowship of the College of Physicians & Surgeons of Pakistan

PDMC: Pakistan Dental Medical Council

the Board comprises 10 senior doctors from the MOH, AM, GSMS and the private sector. It is charged with the responsibility to maintain proper training standards of specialists to meet the manpower needs of Singapore. Thirty-five specialties are recognised in Singapore today.

ii. Specialist Training Committees (STCs)

The SAB appoints 35 STCs whose terms of reference include setting the syllabus for specialist training, recognition of postgraduate qualification and places of training. It advises on manpower requirements of the specialty and oversees the conduct of courses and examinations for the specialty. Each STC comprises 5 to 10 members including representatives from the AM and the GSMS.

iii. The 35 Specialties

Table III lists the 35 Specialties on the Specialist Register in Singapore. Ten of these STCs are administratively supported by the GSMS and the rest by the AM. The ten under the GSMS are those for which the GSMS conducts the M Med examination.

iv. Training Stages

Medical education is a lifelong process, a continuum from undergraduate through postgraduate education and beyond. Specialist training is divided into two stages, basic and advanced. Basic training commences a year after full medical registration, that is two years after

TABLE III : LIST OF SPECIALTIES IN SINGAPORE

The 35 Specialties

1 Anaesthesiology*	19 Obstetrics & Gynaecology*
2 Cardiology	20 Occupational Medicine*
3 Cardiothoracic Surgery	21 Ophthalmology*
4 Dermatology	22 Orthopaedic Surgery
5 Diagnostic Radiology*	23 Otorhinolaryngology/ENT Surgery
6 Emergency Medicine	24 Paediatric Medicine*
7 Endocrinology	25 Paediatric Surgery
8 Gastroenterology	26 Pathology
9 General Surgery *	27 Plastic Surgery
10 Geriatric Medicine	28 Psychiatry*
11 Haematology	29 Public Health Medicine*
12 Hand Surgery	30 Rehabilitation Medicine
13 Infectious Diseases	31 Renal Medicine
14 Internal Medicine*	32 Respiratory Medicine
15 Medical Oncology	33 Rheumatology
16 Neurology	34 Therapeutic Radiology
17 Neurosurgery	35 Urology
18 Nuclear Medicine	

* These 10 are administratively under the GSMS, the rest are under the Academy.

graduation and normally lasts for three years. To complete this stage, the doctor must pass the relevant postgraduate examination. For those where the GSMS does not have the M Med examination, e.g. Pathology, Therapeutic Radiology, Emergency Medicine, Otorhinolaryngology, doctors train locally but proceed overseas to UK or Australia for their examinations. Advanced training is offered in 35 Specialties and lasts 3 to 4 years of which one year may be spent abroad on an overseas scholarship. The end point of advanced training is exit certification / examination and the award of FAMS by the Academy of Medicine. This enables the doctors to apply to be on the Specialist Register.

Historical Perspective

Medical education commenced formally with the founding in 1905 by the British Colonial Government of the King Edward VII College of Medicine. In 1910, the first batch of 7 local doctors graduated. Before the war in 1942, there was no such thing as postgraduate education. Even the traditional apprentice type of training was denied to local doctors. Expatriates, who were in full charge, discouraged the locals from harbouring any dreams of further education. The only course left to them was to go into private practice. "After the war when the health service was reorganized, a new scheme was initiated to send a limited number of doctors on scholarship to UK for postgraduate examinations. Those lucky ones who returned with additional qualifications became specialists in the hospital and teaches at the University."⁴

In 1957, the Academy of Medicine was founded; it organized postgraduate courses and seminars. In 1961,

the Committee for Postgraduate Medical Studies was formed and it became in 1969 the School of Postgraduate Medical Studies. Its task was to organise courses and examinations leading to Master of Medicine degrees in Internal Medicine, Paediatrics, Obstetrics & Gynecology and Surgery and the first M Med doctors graduated in 1970. Over the years, other disciplines were added, the last being M Med (Fam Med) in 1996 and the two diploma examinations in Public Health and Occupational Medicine started in 1970 were upgraded to M Med in 1973. Joint examinations with overseas Royal Colleges were started in the 1980s, with the Edinburgh College for Surgery (1986), Ophthalmology (1989) and the Australian College of Obstetrics & Gynecology in 1993. In 1996, the joint MRCP (UK)/M Med began for Internal Medicine and Paediatrics.

Birth of a Programme

1. Establish a need

Doctors in a community should decide on the health and medical needs of that community. Being interlinked globally through wide medial coverage, doctors should be aware of developments and advances elsewhere in the world. At some point in time therefore, it would be appropriate to introduce such skills, expertise and technology into the community, and the doctors, whose primary responsibility is to give the best treatment and care to their patients, must be brave enough to surface the need for such resources and the training that may be necessary to use such new technology.

The next step is for the government or the University to provide the resources to send young, enthusiastic and committed doctors overseas for proper and full training, who, on their return, will be tasked to form the core of trainers in a unit set up for the purpose. The first outcome expected of the returned scholar doctor must be improved patient care.

2. Status of programme

Once the new service is running well, it will want to grow. Conceptually then the powers that be must decide how this new entity fits into the whole specialty scene of the country. Is it part of a bigger specialty? For example, should Colorectal Surgery remain part of General Surgery? Should it be on its own? Another example is Orthopaedic Surgery. Should the specialty have its own entry and then exit examination? Or is it not a new specialty but a diploma or skills training course e.g. Geriatrics or Laparoscopic Surgery?

3. Roles given to AM & GSMS

What are the roles of these bodies for the new programmes? The Academy coordinates with the Ministry of Defence the Advanced Trauma Life Support Courses and also with the Royal College of Surgeons of England

the Minimal Access Therapy Technique Course. The GSMS runs diploma courses to upgrade skills of doctors, for example in Geriatrics and Family Practice Dermatology. These are in addition to their roles in running and supporting the STCs.

International Recognition

As a programme matures and is accepted by the local doctors and the community, it is opportune to consider its regional, if not, international standing. In Singapore, the attainment of international recognition is through several means. First, through reciprocal recognition of degrees and diplomas in part or in whole by overseas colleges. This allows our doctors to be exempt from certain sections of overseas examinations. Second is through joint examinations locally. The doctor obtains both the M Med and the overseas diploma in the same sitting. Third is when lecturers are invited to help conduct courses. Fourth is external examiners report. Both lecturers and examiners from overseas give feedback on the standards and conduct of courses and examinations. In the early days, Australasia contributed much to postgraduate medicine in Singapore." Fifth, our doctors when sent overseas to world renown centres in the USA, UK or Australia, report on training structures and programmes overseas. They are also reported on by their overseas supervisors as to their lack as well as their strong points. The overseas centres are able to assess the standards of our trainees. Lastly, for examination purposes, some overseas colleges inspect and accredit our training departments, programmes and hospitals, and training done in Singapore is then recognised in part or in whole for examination purposes.

Specialty Supervisors/Mentors

No trainee trains himself unsupervised. There are today Associate Deans in the major restructured hospitals to provide the necessary administrative support for undergraduate and postgraduate education. Most important however is the interested supervisor who is a specialist in the specialty. The supervisor has the responsibility to develop a planned programme with regard to the training syllabus and examination, to co-ordinate the activities and to review the programme regularly to ensure the trainees obtain the necessary experience in good time and pace. It is also important for the supervisor to have periodic dialogue with the trainees to evaluate their performance, recognize any deficiencies and correct them early. All this is part of formative assessment, guiding the trainees over time on the right track to achieve his goal.

Ideally there should be no more than three basic trainees to a supervisor and one advanced trainee to one supervisor. Periodic assessments are essential so that the trainees get adequate and timely feedback on their learn-

ing experience and performance. As postings to departments are usually in six monthly blocks, a supervisor takes charge for six months before the trainee moves onto another supervisor in another department or hospital.

The mentor is the supervisor in chief as it were, who supervises over the total period of basic or advanced training. To help in the assessment, the log book and regular reports by supervisors are essential components to ensure the success of the programme.

Concept Plan for a New Specialty

As new specialties develop overseas, the time may come when it becomes appropriate to consider setting them up locally. The MOH will consider doing so provided the clinicians are able to detail a plan for its implementation. The concept plan, as it is called, would be along the following lines:

- (i) Status of developed Specialty/Subspecialty unit or department.
- (ii) Objectives of the Specialty/Subspecialty unit or department over the next five years.
- (iii) The composition and number of team members required for developing the Specialty /Subspecialty unit or departments.
- (iv) Details of the type of training each member of the team should receive. This includes paramedical staff and technical staff.
- (v) Plans to accomplish the above, inclusive of:
 - (a) local postgraduate training,
 - (b) overseas postgraduate training,
 - (c) practical attachments for specialists,
 - (d) advanced training programmes for consultants,
 - (e) visits of experts to Singapore.
- (vi) Medical centres and institutions overseas from which we can learn from.

Training Syllabus/Experience Required for New Specialty

It is wise to review the experience of other countries in the specialty to be set up locally. We usually look to models in the Colleges of UK, Australasia, and the Boards of American Medicine. Using their programmes and syllabus as the template, local doctors will adapt these overseas programmes to local needs bearing in mind local disease patterns (and hence the volume of cases available to effect the training). The adapted syllabus is then approved by the local specialty body or societies and by government. A further later step would be recognition by overseas colleges after visits by invited experts for accreditation, or as course instructors and examiners.

Challenges

Finally, what are the challenges in the development of such training programmes? I have listed four main ones.

They are: firstly, how big is the new specialty going to be? Is it to be a specialty and hence on the specialist register or as a subspecialty? If it is a specialty in its own right, how does one continue to preserve the present specialty from which it derived e.g. General Medicine or Surgery? It is conceivable that as specialties originate, General Medicine and General Surgery could inadvertently be reduced to residual medicine and residual surgery as each organ, system or orifice is taken out and allowed to be on its own.

The second challenge is the timing of the birth of new specialties. As an example, Hand Surgery is the offspring of Orthopaedic Surgery. When does it stand-alone distinct from Orthopaedic Surgery? One consideration must be its sustainability as a specialty in the country by having the caseload to maintain a department status to allow training of subsequent generations of hand surgeons. Another consideration could be the critical mass of doctors practising that specialty full-time so as to maintain competency and skill, which translate into acceptable patient outcomes.

The third challenge is whether to allow doctors to have more than one specialty to his credit on the Specialist Register. Presently a doctor is allowed to be listed under one specialty (out of the 35 available). Should a doctor be allowed two specialties or even three? In the US doctors could be diplomates of several American Boards but to remain diplomates, they have to be re-certified at regular intervals by each of these Boards. In the UK, doctors are general physicians and general surgeons with special interest in another specialty. This is because it is necessary to retain the general training in order to practise efficiently and effectively in a rural setting.

The last challenge is that of maintaining professional standards. Medical education is a lifelong process and advances in medicine and technology are progressing at faster rates than before. How do we keep up? Who sees to it that doctors are keeping up and how are they doing so? The formal structured training programmes dis-

cussed earlier are normally completed some 8 to 10 years after graduation when a doctor is about 32 years of age. These programmes can be quality assured.⁶ What happens to his standards of practice over the next 30 years? Is re-certification the way to go? Is compulsory CME (Continuing Medical Education) an alternative? Who will assess and certify a 40-year-old doctor's competency? His seniors who are 50 or 60 years old?

Conclusion

"A nation embarking on a comprehensive health service cannot afford to do without a comprehensive system of postgraduate medical education." Good-enough report, 1994, UK.

While Singapore has gone so far towards developing and maintaining a comprehensive system of postgraduate medical education, only the formal structured parts of Basic and Advanced Training are in place, and can still be improved upon. Exit certification and examinations are something very recent. But for the next 30 years of a specialist doctor's practice, what other systems do we need to ensure that all doctors (specialists or not) practise up-to-date and effective medicine? The future will tell us.

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