

# Evolution of postgraduate medical education in paediatrics: the Singapore story

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**ABSTRACT** Postgraduate paediatric education in Singapore has seen a seismic shift in the past 50–60 years, from a primarily time-based, passive, teacher-centric and apprenticeship model with hierarchical learning culture to a competency-based and learner-centric one. The postgraduate medical education system in paediatrics in Singapore will continue to evolve and adapt with best practices in evidence-based medical education, with the aim to train and develop the next generation of paediatricians who will strive to continually improve child and population health in Singapore.

*Keywords:* accreditation, competency-based medical education (CBME), paediatrics, postgraduate medical education, specialist training

## INTRODUCTION

Postgraduate paediatric education in Singapore has seen substantial developments and changes since the establishment of ‘formal’ paediatric care in Singapore in 1921 at what we now know as Singapore General Hospital (SGH), when it first started to provide inpatient medical care for children. This evolution is especially evident in the past 50–60 years, with the setting up of the Mistri Wing in 1955 at SGH, which was the first ever dedicated children’s hospital unit in Singapore.<sup>(1)</sup>

## HISTORICAL CONTEXT

Singapore is a former British colony that gained full independence in 1965. Albeit the small size (728.3 sq. km) of our city-state, it has a population of 5.7 million people primarily concentrated in urban areas. Through the government’s vision to make Singapore a global centre for international trade and commerce, Singapore has, in a relatively short time-frame, transformed from a developing to a developed country, with one of the most cost-effective and efficient healthcare systems in the world.<sup>(2)</sup>

Singapore’s historical British roots and colonial past have played a significant role in the development of medical education here. Under British colonial rule, local graduates were not actively encouraged to undertake formal postgraduate training. This situation changed with the inauguration of the Singapore Academy of Medicine in 1957, which promoted specialisation and encouraged postgraduate study overseas to develop local expertise and training capacity.<sup>(3,4)</sup>

## A STEP IN THE RIGHT DIRECTION

The School of Post Graduate Medical Studies was first established in 1970; this school was responsible for awarding the Master of Medicine degree for all the key specialties, as well as the accreditation of subspecialties.<sup>(5)</sup> In the same year, the first local Master of Medicine in Paediatrics was started.

In the 1960s and 1970s, specialist postgraduate paediatric training did not begin immediately after medical graduation. After

graduation from medical school, all doctors were required to do a one-year internship/housemanship at one of the government hospitals. Thereafter, these young doctors were often tested in the real-world clinical environment as medical officers before they embarked on pursuing a career in specialist training of their choice and preference. Postgraduate medical training then was very much of the ‘see one, do one, teach one’ type, being an apprenticeship-style model of medical education. This was almost always time based, and there was no formal or structured training curriculum. Much of the teaching and learning happened ‘on-the-job’. After completing the stipulated months of clinical attachments within the accredited departments at the public teaching hospitals in Singapore and passing the required clinical examinations, one could technically practice as a specialist.<sup>(6)</sup>

It was not until the 1990s that an initial advanced training programme was formalised. The Advanced Paediatrics training formally started in 1991, overseen by the Joint Committee of Specialist Training. The duration of this advanced training was three years. The primary focus on training then was on medical knowledge, patient care and communication skills. Over the subsequent years, a more formal curriculum was established and other training requirements were introduced to further enhance clinical training. Briefly, this training programme, known as Basic Specialist Training (BST), commenced a year after the compulsory housemanship year. BST normally lasted for a minimum of three years, during which all trainees were required to maintain a logbook record of their work and training. BST concluded with a high-stakes summative clinical examination, the Master of Medicine (MMed) in Paediatrics (the local Master of Medicine (MMed) in Paediatrics [Singapore] was awarded as a conjoined qualification with the MRCP [UK] [Paediatrics], the Membership of the Royal College of Physicians UK, Faculty of Paediatrics in 1997. Subsequently, in the year 2000, the local Master of Medicine [MMed] in Paediatrics was awarded as a conjoined qualification with the MRCPCH [UK], the Membership of the Royal College of Paediatrics and Child Health). This was

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followed by the three-year Advanced Specialist Training, which culminated in another high-stakes summative examination, the Exit Examination, which was a viva examination.<sup>(6)</sup> Paediatrics subsequently moved from Basic Specialist Training and Advanced Specialist Training to seamless training in 2008.

While this model of training had fulfilled its purpose during the late 2000s, it had become clear to the local health ministry and medical educators that the ground was shifting, and that there was an urgent and pressing need for postgraduate medical education reform owing to multiple factors, including but not limited to significant proportions of the workforce practicing without formal postgraduate training or qualifications.<sup>(3)</sup> There was also an urgent need to balance the requirement for service provision and training, and the need for greater supervision and a more formal training structure and curriculum. A shift from a time-based, teacher-centric model to a competency-based, learner-centric one was imperative.

### ACGME-I AND COMPETENCY-BASED MEDICAL EDUCATION (CBME)

The United States (US)-based Accreditation Council for Graduate Medical Education (ACGME) was approached by the Ministry of Health (MOH) to oversee the external accreditation of postgraduate medical education at all public hospitals in Singapore in the latter half of the 2000s. A formal letter of agreement establishing the relationship between the ministry and ACGME-International (ACGME-I) was signed in 2009, and a vice president for accreditation services was appointed to lead ACGME-I later that year.<sup>(7)</sup>

In 2010, Singapore became the first country outside the US to adopt a training structure based on the ACGME Core Competencies framework and seek accreditation by the same council. Paediatrics was one of the first seven specialties that received a mandate from the MOH to redesign its postgraduate medical education structure to meet the standards of the newly constituted ACGME-International. This educational reform marked a dramatic departure from the traditional process-based curriculum in Singapore that, for many years, had emphasised content delivery (medical knowledge and patient care) and relied heavily on workplace-based global ratings and high-stakes summative assessments to ensure competence.<sup>(8,9)</sup>

The ACGME-International Competency-Based Medical Education (CBME) framework and curriculum focused on the assurance of a set of six core competencies,<sup>(10)</sup> namely patient care, medical knowledge, interpersonal and communication skills, professionalism, practice-based learning and improvement, and systems-based practice.

This new US-style system presents a more structured programme with clearly defined core competencies, greater documentation of supervision from the designated faculty, more rigorous formative assessments and feedback sessions, and a stipulated protected time for learning. Overall, this demanded greater accountability as well as documentation from both trainees and educators, while producing significant numbers of trainees who had completed the programme requirements.<sup>(11)</sup>

With the adoption of the ACGME-I CBME framework, a protected time for training was introduced. Programme directors and core faculty members were also accorded protected time for their educational and administrative roles.

This era of CBME has brought forth numerous advantages, including but not limited to protected teaching time, maximum allowable duty hours worked, greater breadth of training and training in other aspects relevant for paediatric practice (such as evidence-based medicine, learning how to teach and team leadership skills).

Currently, the postgraduate residency training in paediatrics in Singapore is a seamless training programme spanning over a minimum of six years, and is targeted at developing a General Paediatric Specialist.<sup>(12)</sup> This consists of a basic training component, the Junior Residency (JR) years, which last for three years (R1 to R3). By the end of R3, an intermediate exam, the Master of Medicine (MMed) in Paediatrics (Singapore), must be successfully completed. The JR training is accredited by the ACGME-I. This is followed by the advanced training component, the Senior Residency (SR) years, which is also a three-year course (R4 to R6). The SR years culminate with the undertaking of the Paediatrics Exit Examination, a viva-style examination. In addition to the minimum years of training, as outlined above, in the true spirit and ethos of CBME, all Residents have an additional three years to complete their training and satisfy all the training deliverables and requirements.

Subspecialty training requires additional training time and requirements to be fulfilled, depending on the particular subspecialty. Currently, six paediatric subspecialties are recognised for Accreditation in a Paediatric Subspecialty, namely Neonatology, Cardiology, Haematology and Oncology, Nephrology, Gastroenterology and Hepatology, and Intensive Care. Other paediatric subspecialties are expected to follow suit in the near future.

In terms of postgraduate examinations, in addition to the previously mentioned Master of Medicine (MMed) in Paediatrics and the Paediatric Medicine Exit Exam, all JRs are required to appear for the annual In-Training Exam, a US-based Boards-style multiple-choice question (MCQ) exam, during their three JR years. Further, all SRs are required to pass the Postgraduate Examination (PGE) in Paediatric Medicine, either before or after the Exit Examinations, in order to successfully complete training as a Paediatric Specialist. The PGE is a hybrid MCQ exam, which includes the American Board of Paediatrics exam questions for Paediatrics as well as other questions more relevant to the local Singapore context.<sup>(13)</sup>

At the time of writing this manuscript, the Specialist Accreditation Board had recently approved the phasing out of the PGE, with the 2021 diet being the last exam sitting. The PGE will no longer be a pre-requisite for completion of training as a Paediatric Specialist. From January 2021, the PGE has been replaced by a robust Competency-Based Assessment (CBA) framework to continue to monitor and evaluate the performance of SRs to assess their readiness for independent practice as a paediatric specialist.

## LOOKING AHEAD TO THE FUTURE

Singapore Health Services and National University Health System are the only two sponsoring institutions (SI) in Singapore that have a Paediatric Residency Training Programme.

To foster a spirit of national collaboration in paediatric training, cross-cluster rotations between the two SIs were introduced for SRs since January 2020. Unfortunately, with the Covid-19 pandemic and infection control measures, this had to be temporarily halted. We hope to restart this in the next academic year.

Much has happened in more than 10 years since the adoption of the ACGME-I and CBME model in postgraduate paediatric education in Singapore. There is a need to review and take stock of our journey so far. Our local Singapore national medical regulatory and training bodies have embraced CBME. At a national level, we need to not only continue to leverage on the strengths and advantages of CBME, but collectively, as a group, to also look ahead to the future to review and adapt this to best meet our unique local needs in Singapore.

Our local Singapore national medical regulatory and training bodies have taken the lead on this and are now playing a more direct and active role in the shaping of postgraduate paediatric education (as well as other medical specialties) in Singapore, hence setting the course for the future. The paediatric postgraduate community in Singapore is excited at this opportunity to review and further enhance the current CBME model with the introduction of Entrustable Professional Activities,<sup>(14)</sup> with an emphasis on CBAs.<sup>(15,16)</sup>

At the coalface, a mixed formative and summative approach to workplace-based assessment, and careful selection of assessment tasks and methods is currently practised to align the learning activities with our planned graduate outcomes, with effective consolidation and transformation of the 'old' and 'new' systems of postgraduate medical education. This has met with practical success in another local Singapore residency programme.<sup>(8)</sup>

## CONCLUSION

The only constant in life is change. There has been a seismic shift in the postgraduate paediatric education system in Singapore from the time of our city-state's independence up to and including the present moment. We have gone from a system that was primarily a time-based, passive, teacher-centric, hierarchical

learning culture and apprenticeship model to one that is primarily competency-based and learner-centric. While much good work has been done, the postgraduate paediatric education system in Singapore continues to evolve and adapt with best practices in evidence-based medical education, with the aim to train and develop the next generation of paediatric specialists in Singapore, who will be advocates for optimal child and population health in Singapore and empowered to continually improve the health and well-being of all children in Singapore.

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