Editorial

eISSN 2005-8330
https://doi.org/10.3348/kjr.2024.1055
Korean J Radiol 2024;25(12):1036-1038

Korean Journal of Radiology
KJR

Training of Radiology Residents in Singapore

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Keywords: Training; Residency; Singapore

INTRODUCTION

Singapore has a population of 6.02 million [1], with 19.9% of the population aged 65-year-old and above. Singapore is poised to become a super aged society in 2026 where 21% of the population will be elderly. This trend has led to rising healthcare needs with radiology being key in most patient journeys. To cope with this, Singapore has now expanded its cohort of diagnostic radiologists to 469 in 2023 [2]. In tandem, we have also increased our annual radiology residency intake from 30 in 2019 to 36 in 2023. Despite this, Singapore still faces a shortage of radiologists [3]. Diagnostic radiology in Singapore includes a wide range of diagnostic and image-guided therapeutic techniques covering radiography, nuclear radiology, diagnostic ultrasound, magnetic resonance imaging, computed tomography, interventional radiology, and molecular imaging. Having a robust training system to ensure radiologists possess the necessary competencies and capabilities to perform key tasks in the healthcare sector has been Singapore's key strategy in manpower planning over the years. This article will describe the evolution and how the current state of competency-based radiology residency training in Singapore supports this strategy.

Received: October 17, 2024 **Accepted:** October 20, 2024
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Overview of Radiology Residency in Singapore

Radiology residency program has a training duration of 5 years in Singapore. Previously the first 4 years of residency were accredited by the Accreditation Council for Graduate Medical Education International. This set a strong foundation for a competency-based medical education and helped ensure the Singapore radiology residency programs met rigorous educational and clinical training standards similar to those in the U.S. In recent years, Singapore has developed our own accreditation framework called the Accreditation of Postgraduate Medical Education Singapore to accredit postgraduate medical training programs in a bid to further contextualise clinical training with the development of local standards. At the same time, competency-based medical education is being emphasised through the implementation of Entrustable Professional Activities (EPAs). EPAs are units of work a specialist is expected to perform upon graduation from residency. EPAs provide clear entrustment levels that residents must achieve at different stages of their training. The corresponding assessments are carefully designed to align with training outcomes. The aim is to foster a more learner-centerd environment, facilitate timely feedback, and move away from time-based criteria for completion of training.

Details of Radiology Residency in Singapore

The Residency program aims to strike a balance between

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clinical experience, didactic teaching, and scholarly activities to build key competencies of Patient Care, Medical Knowledge, Practice-based learning and Improvement, Interpersonal and Communication Skills, Professionalism, and System-based practice. These competencies are mapped against the EPAs to yield a competency-EPA matrix. This allows the program to examine areas of weaknesses in residents from the underlying competencies for further remediation.

To accumulate sufficient clinical experience, the resident will receive training in the nine subspecialties of diagnostic radiology. These include neuroradiology, musculoskeletal radiology, vascular and interventional radiology, cardiothoracic radiology, breast radiology, abdominal radiology, pediatric radiology, ultrasonography, and nuclear radiology. Residents are also required to have documented supervised experience in interventional procedures, which include the performance, interpretation, and management of complications related to vascular and interventional procedures.

In addition, being able to take on after hours (on-call) duties is crucial for developing independent practice skills. Depending on the sponsoring institution (SI), this usually begins in the middle of year 1, with responsibilities being added as they progress.

For didactic teaching, the residency program offers at least five hours of conferences and lectures each week throughout the year. These sessions may be complemented by supplementary educational materials and interactive discussions. Furthermore, the curriculum of each of the nine subspecialty areas covers both adults and children, encompassing relevant anatomy, physiology, disease processes, and imaging. It includes the acquisition and interpretation of conventional radiography, CT, MRI, angiography, and nuclear radiology examinations pertaining to the cardiovascular system.

For scholarly activities, residents must undergo a three-part scholarly activity module during the five years of residency. This comprises attending didactic sessions on research methods, completion of critically appraised topics, and the presentation of a research proposal. Residents are also encouraged to undertake other scholarly projects, such as laboratory research, clinical research, analysis of disease processes, imaging techniques, or practice management topics. They are also encouraged to publish their findings or present their results at institutional, local, regional, or national meetings.

Upon completion of the fourth year of residency, residents embark on a 12-month program under the purview of the Diagnostic Radiology Residency Advisory Committee and provided by the accredited local SIs. The training duration for year 5, Senior Residency in Diagnostic Radiology, comprises 4 rotations of recognised subspecialty blocks, each of 3 months duration. Residents are able to select these subspecialty blocks based on their areas of interest. In terms of assessment, the supervisor must evaluate the resident at the end of each rotation. For accountability, all residents are required to maintain a log of their operative and clinical experiences using the designated case log system.

Summative assessments remain an important component in residency. Year 1 residents must pass a National Plain Film Test after six months of training before they are permitted to interpret and report plain X-rays independently. Residents must also pass specific examinations before progressing to the next residency level. This includes completing the Fellowship of the Royal College of Radiology (FRCR) Part 1 in years 1 and 2, FRCR Part 2A in year 3, final Part 2B in year 4, and finally Diagnostic Radiology Structured Oral Exit Examination (SOEE) in year 5 in order to graduate from residency.

As part of continued efforts to improve the residency program, residents must perform an annual evaluation of the teaching faculty and the training program. These evaluations are submitted to the SI and kept strictly confidential.

CONCLUSION

To address the future demands of healthcare, Singapore's radiology residency program is continually being refined and expanded. The aim is to bridge the gap in manpower while maintaining the quality of training for those entering the field.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Charles Xian Yang Goh, Cher Heng Tan, Francis Cho Hao Ho. Writing—original draft: Hsien Min Low, Tze Chwan Lim, Francis Cho Hao Ho. Writing—review & editing: Chow Wei Too, Charles Xian Yang Goh, Francis Cho Hao Ho.

https://doi.org/10.3348/kjr.2024.1055

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Funding Statement
None

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