Specialty Training Requirements (STR)

Name of Specialty:	Paediatric Surgery
Chair of RAC:	A/Prof Caroline Ong
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Contents

Note: In addition to the training requirements stated in this STR, residents must comply with any other regulatory requirements or practice-based requirements mandated by the healthcare institutions or place of practice.

Scope of Paediatric Surgery

Paediatric Surgery (PS) encompasses a broad range of congenital and acquired surgical diseases in babies, children and adolescents. PS diseases include operative and non-operative paediatric and neonatal conditions in general surgery, non-cardiac thoracic surgery, urology and gynaecology.

Purpose of the Residency Programme

The PS programme aims to produce a graduate with the appropriate knowledge, clinical skills and attitude to function independently and ethically as a general paediatric surgeon in Singapore. The clinical competencies expected include sound clinical judgement, operative technical competence, good communication and ability to engage with current evidence to provide up-to-date patient-centred care in collaboration with rest of healthcare team.

Admission Requirements

At the point of entry to this residency programme, residents must have fulfilled the following requirements:

At the point of application for this residency programme,

a) Applicants must be employed by employers endorsed by Ministry of Health (MOH); and

b) Residents who wish to switch to this residency programme must have waited at least one year between resignation from his/her previous residency programme and application for this residency programme.

At the point of entry to this residency programme, residents must have fulfilled the following requirements:

a) Hold a local medical degree or a primary medical qualification registrable under the Medical Registration Act (Second Schedule);

b) Have completed Post-Graduate Year 1 (PGY1); and

c) Have a valid Conditional or Full Registration with Singapore Medical Council(SMC);

a) Have completed at least 2 years' postgraduate working experience; and

b) Candidates should have completed at least 12 months of surgical rotations, of which at least 3 months must be in Paediatric Surgery.

There are 2 routes to training in PS. The first route is via SIG-PS residency programs. The second route entails completion of General Surgery residency training or

accreditation as a general surgeon before mid-stream entry into a PS residency programme.

MID-STREAM ENTRY (Entry at R4)

For mid-stream entry, applicants must have passed MRCS and fulfil **either** of the following entry criteria:

i. Successful completion of Joint Committee on Specialist Training (JCST) / Accreditation Council for Graduate Medical Education International (ACGME-I)/APMES accredited General Surgery programme, or
ii. Doctors who are registered with SMC and have obtained specialist accreditation in General Surgery by the Specialists Accreditation Board (SAB) upon commencement of the training programme.

Mid-stream entry candidates fulfilling above criteria may apply to start residency at R4 level if they have continued active surgical clinical practice since completing the JCST / ACGME-I/ APMES accredited General Surgery programme or achieving specialist accreditation in General Surgery.

In general, all applicants who have a break of more than 6 months from active surgical clinical practice require re-assessment of clinical competency.

Selection Procedures

Applicants must apply for the programme through the annual residency intake matching exercise conducted by Ministry of Health Holdings (MOHH).

Continuity plan: Selection should be conducted via a virtual platform in the event of a protracted outbreak whereby face-to-face on-site meeting is disallowed and cross institution movement is restricted.

Less Than Full Time Training

Less than full time training is not allowed. Exceptions may be granted by Specialist Accreditation Board (SAB) on a case-by-case basis.

Non-traditional Training Route

The programme should only consider the application for mid-stream entry to residency training by an International Medical Graduates (IMG) if he/she meets the following criteria:

a) He/she is an existing resident or specialist trainee in the United States, Australia, New Zealand, Canada, United Kingdom and Hong Kong, or in other centres/countries where training may be recognised by the Specialist Accreditation Board (SAB)

b) His/her years of training are assessed to be equivalent to the local training by JCST and/or SAB.

Applicants may enter residency training at the appropriate year of training as determined by the Programme Director and RAC. The latest point of entry into residency for these applicants is Year 1 of the senior residency phase.

Separation

The PD must verify residency training for all residents within 30 days from the point of notification for residents' separation / exit, including residents who did not complete the programme.

Duration of Specialty Training

The training duration must be 48 months (R3 – R6). Residents must successfully complete the 24-months SIG residency to commence PS residency.

The training duration for residents entering mid-stream as R4 is 36 months (R4 – R6).

Maximum candidature: All residents must complete the training requirements, requisite examinations and obtain their exit certification from JCST not more than 36 months beyond the usual length of their training programme. The total candidature for PS is 24 months SIG residency + 48 months PS residency + 36 months candidature.

The maximum candidature for residents entering mid-stream as R4 residents is 36 months PS residency + 24 months candidature.

Nomenclature:

PS R1 = SIG Year 1 (earliest PGY3)
PS R2 = SIG Year 2
PS R3 = External Adult Surgical Rotations (Oversight by PS Programme)
PS R4 – R6 = Paediatric Surgical Rotations (Applicable both to SIG and midstream candidates)

"Make-up" Training

Make-up" training must be arranged when residents:

- Exceed days of allowable leave of absence / duration away from training or
- Fail to make satisfactory progress in training.

The duration of make-up training should be decided by the Clinical Competency Committee (CCC) / Joint Coordinating Committee (JCC) and should depend on the duration away from training and/or the time deemed necessary for remediation in areas of deficiency. The CCC/JCC should review residents' progress at the end of the "make-up" training period and decide if further training is needed.

Any shortfall in core training requirements must be made up by the stipulated training year and/or before completion of residency training.

Learning Outcomes: Entrustable Professional Activities (EPAs)

Residents must achieve level 4 of the following EPAs by the end of residency training:

	Title
EPA 1 DS	Managing day surgery list of minor operations in babies and children (3 months-18y)
EPA 1.1 DS (Lower Complexity) Herniotomy	Nested DS Lower complexity: Performing day surgery inguinal herniotomy in babies and young children (3 months to 7 years old)
EPA 1.2 DS (Higher Complexity) Orchidopexy	Nested DS Higher complexity: Performing day surgery orchidopexy for palpable undescended testis in babies and children (6 months to 3 years old)
EPA 2 Clinic	Managing common elective conditions in babies and children (0-18y) in the surgical outpatient clinic setting
EPA 3 On call	Managing patients admitted or referred to PS in acute inpatient setting
EPA 4 Neonatal	Managing neonates with surgical conditions
EPA 4.1 Neonatal Preop	Managing neonates with emergency surgical conditions (Pre-operative)
EPA 4.2 Neonatal Op	Managing neonates with surgical conditions (Operative)
EPA 5 Urology	Managing major urological conditions in babies and children (0-18y)
EPA 6 Oncology	Managing major surgical oncological conditions in babies and children (0-16y)
EPA 7 Thoracic	Managing major thoracic conditions in babies and children (0-18y)
EPA 8 HPB-GI	Managing major hepato-pancreatico-biliary (HPB) and gastrointestinal (GI) surgical conditions in babies and children (0-18y)

Learning Outcomes: Core Competencies, Sub-competencies and Milestones

The programme must integrate the following competencies into the curriculum, and structure the curriculum to support resident attainment of these competencies in the local context.

Residents must demonstrate the following core competencies:

1) Patient Care and Procedural Skills

Residents must demonstrate the ability to:

- Gather essential and accurate information about the patient
- Counsel patients and family members
- Make informed diagnostic and therapeutic decisions
- Prescribe and perform essential medical procedures

- Provide effective, compassionate and appropriate health management, maintenance, and prevention guidance

R3 residents must demonstrate

1. Ability to manage common surgical conditions in adults:
   1.1. Getting relevant history, do proper physical examination and order appropriate investigations in assessment of common surgical conditions in adults
   1.2. Proposing appropriate differential diagnoses and management plan, offering surgical intervention as appropriate and/or referral to relevant specialists
   1.3. Preoperative preparing of the surgical patient, including management to reduce operative and anaesthetic risks
   1.4. Taking informed consent for straight forward cases

2. Basic surgical skills:
   2.1. Familiarity with basic operative technical skills (instrument handling, tissue handling, haemostasis, diathermy use, suturing and knot-tying)
   2.2. Principles of endoscopy, thoracoscopy and laparoscopy

3. Ability to perform peri-operative care of the surgical patient
   3.1. Operating theatre practices (anti-sepsis and safety)
   3.2. Principles of anaesthesia (general, regional and local) and pain control
   3.3. Principles of management of bleeding and use of blood products
   3.4. Post-operative care of the surgical patient, including fluid/nutrition management and complications

4. Ability to assess and manage patients with trauma
   4.1. Principles of assessment and resuscitation in multi-trauma

5. Ability to manage death and dying patient
   5.1. Management of the dying patient in consultation with the palliative care team
   5.2. Principles of organ and tissue transplantation
   5.3. Principles of brain stem death and its relevance to organ donation, including the relevant legislation in the Singapore context

6. Ability to manage children's health and illness (where relevant)
   6.1. Obtaining history and doing physical examination in children /adolescents
   6.2. Communication with the family/care giver

Senior (R4-R6) residents must demonstrate:

1. Generic knowledge and skills specific to paediatric patients
   a) Basic science knowledge specific to paediatrics
   b) Specific features of the management of children's health and illness including appropriate professional behaviour in dealing with children and families
   c) Assessment and management of paediatric surgical patients in the inpatient, outpatient and emergency setting, including acute paediatric resuscitation.
2. Knowledge and skills pertaining to Paediatric General Surgery
   a) Assessment and management of children with acute abdominal pathology
   b) Assessment and management of children with gastrointestinal bleeding
   c) Assessment and management of children with hepatobiliary lesions

d) Assessment and management of children with abdominal wall herniae
e) Assessment and management of children with head and neck lesions
f) Assessment and management of children with non-cardiac thoracic lesions
g) Assessment and management of paediatric trauma

3. Knowledge and skills pertaining to Neonatal Surgery
   a) Assessment and management of neonates with acute abdominal pathology
   b) Assessment and management of neonates with congenital anomalies of the gastrointestinal tract
   c) Assessment and management of neonates with abdominal wall defects
   d) Assessment and management of neonates with thoracic/ diaphragmatic conditions
   e) Assessment and management of neonates with other major surgical conditions
4. Knowledge and skills pertaining to Paediatric/Neonatal Urology
   a) Assessment and management of children with urinary tract infection
   b) Assessment and management of children with both upper and lower urinary tract abnormalities
   c) Assessment and management of children with genital disorders, including hypospadias, undescended testis, and disorders of sex development.
5. Knowledge and skills pertaining to Paediatric Surgical Oncology
   a) Assessment and management of children with cancer-related surgical issues including vascular access and complications of cancer treatment
   b) Assessment and management of newly diagnosed mass
   c) Assessment and management of common childhood solid tumours
6. Knowledge and skills pertaining to Paediatric Critical care
   Assessment and management of fluid/ electrolytes, nutrition, analgesia, ventilation and other supportive management of the critically ill surgical neonate and child.

2) Medical Knowledge

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care.

Residents must demonstrate:

- Basic science knowledge relevant to surgical practice: Anatomy, physiology, pharmacology, pathology, microbiology
- Knowledge in the differences in the basic sciences in children relative to adults - e.g. Anatomy, physiology. pharmacology and their relevance to clinical management

3) System-based Practice

Residents must demonstrate the ability to:

- Work effectively in various health care delivery settings and systems relevant to their clinical specialty.
- Coordinate patient care within the health care system relevant to their clinical specialty.
- Incorporate considerations of cost awareness and risk/benefit analysis in patient care.

- Advocate for quality patient care and optimal patient care systems.
- Work in inter-professional teams to enhance patient safety and improve patient care quality. This includes effective transitions of patient care and structured patient hand-off processes.
- Participate in identifying systems errors and in implementing potential systems solutions.

4) Practice-based Learning and Improvement

Residents must demonstrate a commitment to lifelong learning.

Resident must demonstrate the ability to:
- Investigate and evaluate patient care practices
- Appraise and assimilate scientific evidence
- Improve the practice of medicine
- Identify and perform appropriate learning activities based on learning needs

5) Professionalism

Residents must demonstrate a commitment to professionalism and adherence to ethical principles including the SMC's Ethical Code and Ethical Guidelines (ECEG).

Residents must:
- Demonstrate professional conduct and accountability
- Demonstrate humanism and cultural proficiency
- Maintain emotional, physical and mental health, and pursue continual personal and professional growth
- Demonstrate an understanding of medical ethics and law

Residents must demonstrate understanding of ethical issues in paediatrics and adolescence.

6) Interpersonal and Communication skills:

Residents must demonstrate ability to:
- Effectively exchange information with patients, their families and professional associates.
- Create and sustain a therapeutic relationship with patients and families
- Work effectively as a member or leader of a health care team
- Maintain accurate medical records.

Other Competency: Teaching and Supervisory Skills

Residents must demonstrate ability to:
- Teach others
- Supervise others

Residents must demonstrate participation in teaching of medical students / nurses / peers.

Learning Outcomes: Others

Residents must attend Medical Ethics, Professionalism and Health Law course conducted by Singapore Medical Association.

Learning Methods and Approaches: Scheduled Didactic and Classroom Sessions

Residents must attend a minimum of 16 hours of dedicated educational and learning activities each month. These could be a combination of didactic sessions or bedside teaching sessions facilitated by faculty and peers. In the event of an outbreak whereby face-to-face on-site teaching sessions are disallowed, these learning activities should be conducted via virtual platforms.

The programme must organise a series of didactic educational sessions that cover the core knowledge of PS.

The programme must organise the following teaching activities on a regular basis:

a) Resident tutorials
b) Departmental conferences (e.g., X-ray meeting, morbidity and mortality meeting, journal club, surgical pathology meeting)
c) Multidisciplinary conferences (e.g., tumour board, trauma conference, vascular malformation meeting)

Residents must attend the following courses:

a) Ethics Course by SMA
b) Quality Improvement Course

Residents must obtain and maintain valid certification in the following:

a) Basic Cardiac Life Support
b) Advanced Cardiac Life Support (until R3)
c) Advanced Trauma Life Support

Residents are encouraged to attend the following: Paediatric Advanced Laparoscopy Course, Definitive Surgical Trauma Care course, Ultrasound Workshop, Paediatric Fundamental Critical Care Support course.

Patient-based teaching must be conducted during ward rounds, to ensure that core topics are covered during the discussions between attending physician and residents. This contributes to the minimum 16 hours requirements.

Learning Methods and Approaches: Clinical Experiences

Residents must have the following rotations in R3:

- General Surgery 6 months
- Paediatric Surgery 6 months

During Paediatric Surgery rotations in R4-R6, residents must function as registrars within the team led by one or more consultant(s). Residents should supervise junior doctors, organise ward rounds, manage patients in the team clinic, answer inpatient

referrals (consultation requests) from other disciplines, manage elective and emergency admissions, assist and perform operations. Supervision for these activities should be reduced in tandem with the development of increasing competence, as regularly assessed by the programme.

Intensive Care Rotations

Residents must have 1-month rotation in each of the following: Children's Intensive Care Unit, Neonatal Intensive Care Unit, and Paediatric Anaesthesia.

Residents must have Intensive Care rotation for maximum of 3 months during R4 – R6.

Each 1-month posting may be taken consecutively or individually.

During intensive care rotations, residents should not assume registrar-level responsibility for any of the cases managed. Decisions should be discussed with and approved by the managing team from the appropriate specialty. The resident should not be on the specialties' call roster but should do once a week "tag-on" calls.

Learning Methods and Approaches: Scholarly/Teaching Activities

Residents must complete the following activities by the end of residency:

a) At least 1 original basic/clinical/educational research project or quality improvement project as Principal Investigator

b) At least 1 poster or oral presentation at a local or international conference

c) Participate in department teaching of juniors (e.g., medical officers / junior residents, nurses and medical students) and supervise junior doctors in the clinical care team.

Residents are encouraged to publish in peer-reviewed journals and teach in basic surgical skills workshop.

Learning Methods and Approaches: Documentation of Learning

R4-R6 residents should attend as supervised surgeon and/or assistant and log the following in the resident's logbook:

'Relevant paediatric cases logged during R1-3 may be included in the total logbook requirement.

Overall Categories (Main) [1]	Recommended	Minimum
Neonatal Surgery (not including hernias)	40	30
Abdominal Surgery (not including hernia/ hydrocoeles and appendicectomy)	90	60

[1] The recommended and minimum numbers in the "overall categories" table exceed the sum of the individual operations in the respective categories, to allow inclusion of operations that may not be neatly classified.

Head and Neck Surgery	30	10
Thoracic surgery	25	10
Oncosurgery (not including CVAD)	20	10
Paediatric Urology (not including cystoscopy, orchidopexy and testicular torsion surgery)	60	40

Categories defined: Neonatal Surgery	Recommended	Minimum
Malrotation – Ladd's procedure	5	2
NEC laparotomy	5	2
Neonatal stoma	5	2
Abdominal wall defects repair	5	2
Diaphragmatic hernia repair	5	2
Duodenal Atresia/ stenosis/ web anastomosis	3	1
Intestinal Atresia/ stenosis/ web anastomosis	3	1
Oesophageal atresia +/- TOF repair	2	1
Sacrococcygeal teratoma excision	1	nad
Neonatal herniotomy (no. of patients)	30	20

Categories defined: Abdominal Surgery	Recommended	Minimum
Fundoplication +/- Gastrostomy	10	5
Intestinal obstruction	10	5
ARM definitive surgery	10	5
Pyloric stenosis (Pyloromyotomy)	10	3
Hirschsprung's definitive surgery	5	3
Biliary atresia / Choledochal cyst definitive surgery	5	3
Splenectomy	5	3
Hernia/ hydrocele	200	100
Appendicectomy (laparoscopic / open)	100	50

Categories defined: Head and Neck Surgery	Recommended	Minimum
Lymph node excision	5	3
Thyroglossal cyst- Sistrunk's operation	5	2
Others (e.g. Thyroid or salivary gland surgery, excision of branchial remnant, lymphatic malformation etc)	10	3

Categories defined: Thoracic Surgery	Recommended	Minimum
Decortication/ Debridement (thoracoscopic / open)	5	3
Lung resection (thoracoscopic / open)	5	2

Categories defined: Oncosurgery	Recommended	Minimum
Wilms/ neuroblastoma radical excision	5	2
Ovarian / Testicular tumour excision	5	2
Hepatoblastoma excision	2	nad
Rhabdomyosarcoma / sarcomas excision	1	nad
Central venous access device (CVAD) Insertion / removal	20	10

Categories defined: Paediatric Urology	Recommended	Minimum
Hypospadias repair	30	10
Pyeloplasty/ Ureter Reimplantation	15	10
Nephrectomy / Nephroureterectomy (Non-oncology; urology indications only	5	2
Cystoscopy +/- intervention	20	10
Orchidopexy	50	25
Exploration for testicular torsion	10	5

Summative Assessments

	Summative assessments	
	Clinical, patient-facing, psychomotor skills etc.	Cognitive, written etc.
R1		
R2	MRCS Part B (OSCE)	MRCS Part A (MCQ)
R3		
R4		
R5		
R6	**Exit Examination** Clinical (50%) * 1 Long Case (30 mins) 3 Short Cases (10 mins each) *Candidates have to pass the Clinical Exam in order to proceed to the Viva	**Exit Examination** Viva (50%) 20 Questions (100 mins in total)

The summative assessments are MRCS and Exit Examination.
The summative exam for PS exit at completion of training (completed AST or R6) is a local examination, with 2 local examiners and one invited external (overseas) examiner.

For protracted outbreak, the continuity plan for the exit examination is to follow a hybrid format, following institution guidelines for safe distancing measures to protect all participants, including the patients invited for long and short cases. The overseas examiner participates via virtual platforms.

S/N	**Learning outcomes** based on the competencies (selected) in the PS AST Curriculum	**Summative assessment components**	
		Exit Exam Clinical Cases	Exit Exam Viva
1.	Medical knowledge	X	X
2.	Patient care	X	
3.	Interpersonal and communication skills	X	
4.	Professionalism	X	