

# **AST PROGRAMME PAEDIATRIC GASTROENTROLOGY**

## **(A) INTRODUCTION**

### **Definition**

Paediatric and adolescent medicine is the branch of medicine that deals with the health of infants, children and adolescents. Childhood and adolescence is the period of greatest growth, development and maturation of the various organ systems, and therefore paediatric and adolescent medicine must also address the influence of health and disease during this period.

The Advance Specialist Training (AST) Programme in Paediatric Gastroenterology provides opportunities for further training in Paediatric Gastroenterology to senior residents who have completed Paediatric Medicine Training. These senior residents would have achieved competence in basic paediatric and neonatal care, and have achieved the competencies of a General Paediatric Specialist, including an understanding of Adolescent Medicine, and its impact on Subspecialty care. The Dually Accredited Paediatric Gastroenterologist will be able to address the more complex Gastroenterology problems which occur in infants, children and adolescents, and will be able to manage these problems in the context of the children's physical, mental and emotional growth and development from infancy to adolescence, and the transition into adulthood.

### **Objective(s) of Training**

The goal of the Structured Training Programme for Paediatric Gastroenterology:

The programme is based on the trainees' ability to acquire further knowledge and skills in General Paediatrics and Adolescent Medicine, as well as Paediatric Gastroenterology, Hepatology and Nutrition including liver transplantation. It is competence-based. The period of training can be extended if the trainee has not been able to satisfy the minimum requirements as stipulated in the training objectives and content.

## **(B) PROGRAMME OVERVIEW**

### **Trainee Duration**

The programme for Paediatric Gastroenterology Subspecialty Training is conducted for a period of 2 years, after successful exit from the Paediatric Medicine Residency Training Program.

## **(C) ADMISSION REQUIREMENTS**

### **Entry Criteria/ Pre-requisites**

Applicants must fulfill the following entry criteria/ pre-requisites as stated below:

- commencement of sub-specialty would be after exiting from Paediatric Medicine residency
- Residents can apply only in their final year of residency (R6)

## **(D) TRAINING SYLLABUS**

## **Competencies for the AST Programme in Paediatric Gastroenterology**

### **i. MEDICAL KNOWLEDGE**

- a) Fundamental knowledge base and ability to apply such knowledge base to provide appropriate clinical care in general paediatrics.
- b) Appropriate and advance knowledge for competent practice in paediatric gastroenterology, hepatology and nutrition. (Appendix A)
- c) Understand and interpret relevant laboratory and imaging studies.
- d) Recommend endoscopic procedures on the basis of personal consultation and consideration of specific indications, contraindications, and diagnostic and therapeutic alternatives.
- e) Recognize common gastrointestinal pathology viewed during endoscopy.
- f) Understand the pharmacology, indications, age-appropriate dosages and side effects of commonly prescribed medications

### **ii. PATIENT CARE**

- a) Perform complete, timely histories and physical exams on hospitalized patients with gastrointestinal complaints.
- b) Establish a differential diagnosis, evaluation plan and management plan for common signs and symptoms of gastrointestinal diseases.
- c) Communicate findings in a complete, written note and orally present them in a concise manner.
- d) Order appropriate laboratory investigations, procedures and imaging studies for patients with gastrointestinal diseases.
- e) Initiate appropriate therapy.
- f) Initiate appropriate parenteral or enteral nutrition.
- g) Perform esophagogastroduodenoscopy, colonoscopy, and other procedures as stated in Appendix B.
- h) Acquisition of advanced life support management skills.

### **iii. PRACTICE-BASED LEARNING AND IMPROVEMENT**

- a) Be committed to on-going personal learning and development
- b) Be able to locate and appraise scientific evidence and clinical studies related to their patients' health problems.
- c) Use information technology including online resources.
- d) Participate in weekly teaching session for fellows/residents.
- e) Attend local conferences and seminars.

### **iv. INTERPERSONAL AND COMMUNICATION SKILLS**

- a) Communicate effectively and sensitively with patients and their families, colleagues and other allied health professionals.
- b) Work effectively with residents, fellows, and registrars, consultants, nursing staff, ancillary staff and social services.
- c) Effectively communicate home care instructions, including medication usage and follow-up to families.
- d) Communicate with the referring physician(s), both verbally and in writing.
- e) Able to recognise the various socio-economic and cultural factors that contribute to illness and vulnerability in patients from diverse backgrounds.

### **v. PROFESSIONALISM**

- a) Behave in a professional and ethical manner at all times.
- b) Maintain professional and empathetic behaviour towards parents in the stressful setting of

the hospital.

- c) Arrive on time for rounds, clinics, procedures, conferences and meetings.
- d) Arrange coverage if unable to meet scheduled commitments.
- e) Maintain patient confidentiality.
- f) Demonstrate sensitivity and respect for cultural diversity of patients.
- g) Demonstrate respect for co-workers and ancillary staff.

**vi. SYSTEMS-BASED PRACTICE**

- a) Demonstrate awareness and understanding of the capacity of the hospital system to provide timely care.
- b) Understand the requirements of insurers and managed care organizations for referral and payment of hospital services.
- c) Utilize ancillary staff appropriately.
- d) Understand billing and coding for in-patients as well as outpatients.
- e) Know the cost effectiveness of commonly used diagnostic and therapeutic approaches to gastrointestinal diseases.
- f) Participate in audit and quality improvement projects

**5.2 Additional competencies to be achieved at the end of training:**

- a) Ability to perform allocated tasks and plans and prioritises tasks appropriately
- b) Recognising the need for, and development of appropriate patient advocacy skills
- c) Ability to work within multi-disciplinary teams.
- d) Development of leadership skills while still accepting leadership from other members of the multi-professional team.
- e) Recognising the need to promote and maintain excellence through actively supporting or participating in research and a program of continuing professional development.
- f) Ability to design audit projects and write appropriate clinical guidelines
- g) Understand risk management
- h) Ability to perform allocated teaching and training tasks, plan and deliver teaching to trainees and other professionals
- i) Development of mentoring skills
- j) Development of management skills and ability to take responsibility for a defined project.

**Scholarly Activity:**

In addition to participating in a core curriculum in scholarly activities which include formal lectures, teaching programmes and subspecialty meetings, trainees will be expected to engage in projects in which they develop hypotheses or in projects of substantive scholarly exploration and analysis that require critical thinking. The trainee will be expected to present evidence of this scholarly activity at the Paediatric Gastroenterology Exit Examination. Examples of Scholarly Activity include:

- a) Presentation of work at regional and international conferences
- b) First author paper published in a peer-reviewed journal, preference will be for a hypothesis-driven piece of work, or a critical meta-analysis of the literature, or a systematic review of clinical practice
- c) Part of a thesis submission for a PhD or Masters of Clinical Investigation
- d) Book chapter
- e) Writing of guidelines
- f) Clinical practice improvement projects
- g) Successful submission of an external grant

## Evaluation of the Paediatric Gastroenterology Trainee:

**Table 1: Expected frequency of assessments**

	AST – Yr. 1	AST – Yr. 2
<b>CBD</b>	2 every 6 months	2 every 6 months
<b>MSF</b>	1 every 6 months	1 every 6 months
<b>Portfolio review</b>	1 every 6 months	1 every 6 months
<b>Supervisor's report</b>	1 every 6 months	1 every 6 months
<b>Exit Examination</b>	2 every 6 months	2 every 6 months

**Table 2: Other areas of curriculum and assessment**

<b>Patient Care</b>	Lectures, interactive tutorials, journal clubs All trainees must clock in $\geq 4$ hours training time per week, encompassing these activities.  <b>Assessment:</b> CBD Scholarly Activity Exit Examination
<b>Medical knowledge</b>	
<b>Practice based learning</b>	Gastroenterology- Case Conference Gastroenterology Audit Journal club: leads discussions Clinical Practice Improvement Programme or Audit Project Paediatric Gastroenterology Competencies  <b>Assessment:</b> Supervisor to assess performance
<b>Communication skills</b>	Leads tutorials, supervised teaching of junior residents by senior residents  <b>Assessment:</b> Supervisor to assess performance at tutorials MSF CBD: skills in written documentation
<b>Professionalism</b>	Reflective exercises documented for portfolio and discussed with supervisor  <b>Assessment:</b> MSF

<b>System based practice</b>	Morbidity / Mortality rounds / Sentinel events: identifying system errors  <b>Assessment:</b> MSF: Ability to function as part of a multi-disciplinary team
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The objectives of formative work-based assessment are as follows:

- To ensure that trainees have acquired the required level of knowledge and skills to practice safely at the level expected
- To support trainees in their learning and to provide feedback for improvement
- To identify trainees who may be struggling with competence, so that targeted support and remedial teaching can be provided

All trainees must achieve a minimum pass for the formative work-based assessments, as well as compulsory participation in workshops and projects as stated in the training portfolio.

#### ***Check List of Practical Skills and Competencies in Paediatric Gastroenterology***

The Senior Resident must complete satisfactorily the check list of practical skills and competencies in Paediatric Gastroenterology as outlined in Appendix A.

### **E) INSTITUTIONAL REQUIREMENTS (FACILITIES & RESOURCES)**

#### **Minimum and Preferred Teaching Faculty: Trainee Ratio**

All the members of the teaching staff should have received accreditation by the Specialist Accreditation Board. The teaching faculty should represent paediatric gastroenterologists and the full range of paediatric subspecialties and other related disciplines such as paediatric surgery, radiology, and child psychiatry. The minimum teaching faculty: trainee ratio will be as determined by the Specialist Accreditation Board.

Designated supervisors as defined by the Specialist Accreditation Board are required to meet and review the trainee's progress every 2 months. The aim of such a review is to ensure that the trainee is exposed to and taught all aspects of the specialty. Deficiencies in training (both theoretical and practical) should be recognised, and appropriate steps taken to overcome them.

#### **Requirements for Facilities for Study and Training**

Adequate inpatient and outpatient facilities must be available to meet the needs of the general and subspecialty programmes. There must be a full intensive-care facility, as well as a facility for dealing with paediatric emergency patients. Patients should range in age from the newborn through to the young adult. There should be adequate numbers of inpatients and outpatients, as well as new and follow-up patients so as to ensure sufficient clinical exposure and training. Support services should include clinical laboratories, intensive care, occupational and physiotherapy, speech pathology, diagnostic imaging, dietetics, pathology, and social services.

Trainees must have access to on-site library or collection of appropriate texts and journals, as well as computer access to electronic databases and on-line search engines for medical literature.

### **(F) SUPERVISION OF TRAINEES**

#### **Supervision of Training**

### **Advanced training**

Clinical duties will include supervision of a ward, inpatient consults, outpatient general and subspecialty clinics, and special procedures provided by a subspecialty. Trainees must keep a log of their training activities and record their training experience. Responsibility for supervision is accorded by the consultant heading that particular subspecialty, and includes clinical work, research focus and 6-monthly assessments.

## **(G) ASSESSMENT AND FEEDBACK**

### **Logbook**

All trainees are expected to keep a log book which will be reviewed on a monthly basis by the main supervisor. The log book will have a record of cases managed or consulted. Notes should be made regarding difficult or complicated cases. CME activities should also be recorded.

All other teaching experiences e.g. conferences, seminars, papers presented should also be recorded.

### **Documentation of training**

Documentation of work experience and training received will be Paediatric Gastroenterology (Annex B) training portfolios. The Paediatric Gastroenterology training portfolio must be submitted at the Exit Examination in Paediatric Gastroenterology. Trainees are expected to attend a minimum of 4 hours of training sessions per week. The training portfolio will help to:

- Trainee's work experience, training
- Education supervision
- Professional development plans
- Workshops attended
- Reflective entries
- Annual review of 6 core competencies
- Requisite formative work assessments

### **Feedback**

Six-monthly interviews with the trainees should be conducted to ensure that the training objectives for each rotation have been adequately met, as well as to monitor for any difficulties in workload and training activities. Feedback forms should also be provided at the end of each posting, and the programme supervisor is responsible for collating the results and instituting the appropriate changes to the training programmes

## **(H) EXIT EXAMINATION**

## **Exit Examination in Paediatric Gastroenterology**

The trainee must undergo an Exit Examination in Paediatric Gastroenterology upon satisfactory completion of advanced training. The trainee must pass the Exit Examination within the stipulated training period ( maximum training period would be 3 years from the start of Gastroenterology training), unless special permission has been obtained from JCST for any extenuating circumstances, in order to be accredited by the Specialist Accreditation Board (SAB) of the Singapore Medical Council (SMC) as a Paediatric Gastroenterologist.

## **Application for Exit Examination**

Candidates who have completed the requirements for advanced training and are eligible for the Paediatric Gastroenterology Exit Examination must submit their completed training portfolios and a letter from their Heads of Departments indicating that they have fulfilled all the posting requirements satisfactorily. Candidates will be notified of the exit examination dates at least 2 months in advance.

## **Exit Examination Format**

The exit examination shall consist of the following sections:

- Appraisal of the Scholarly Activity, Reflective Entry on an adolescent problem in Paediatric Gastroenterology and assessment of experience and competence based on the log book.
- Structured Examination consisting of the following sections:
  - Clinical case scenarios on any problem in General Paediatric GHN
  - Journal critique on a problem in Paediatric GHN

\*GHN – Gastroenterology, Hepatology and Nutrition

## **Timing of Exams**

The examinations are held annually, not earlier than 3 months before end of training

## **(I) GENERAL GUIDELINES**

**Please refer to Annex 1 for General JCST Guidelines on the following:**

- Leave Guidelines
- Training Deliverables
- Changes to Training Period
- Part-time Training
- Overseas Training
- Withdrawal of Traineeship
- Exit Certification

## **Appendix A**

## **CURRICULUM FOR AST PROGRAMME IN PAEDIATRIC GASTROENTEROLOGY LEADING TO SPECIALIST ACCREDITATION IN SINGAPORE**

## Components of Training

The 24-months training must include:

Training in paediatric gastroenterology, hepatology and nutrition; the latter would include training both in enteral and parenteral nutrition support, ideally in a multi-disciplinary setting. Six of these 24 months should be spent in a unit with liver transplant experience. The trainee would also be expected to run his/her own specialty clinics in paediatric gastroenterology, as well as a regular endoscopy list under supervision.

During training, the trainee must also be provided with the opportunity to provide subspecialty consult service to colleagues from general paediatrics and other subspecialties under supervision, both during and out-of-hours.

A maximum of 6 months can be spent in research training provided that the trainee is on-track to meet clinical training competency requirements.

Time in an approved overseas centre for up to 6 months would be accredited towards training. However, trainees would need to seek approval prospectively for this.

## Knowledge & Components for Paediatric Gastroenterology Training

### 1. Gastroenterology

Growth failure/failure to thrive and malnutrition.

Malabsorption disorders (coeliac disease, cystic fibrosis, pancreatic insufficiency, immunodeficiencies)

Intractable diarrhoea syndrome.

Chronic inflammatory bowel disease.

Gastrointestinal food allergy.

Helicobacter pylori gastritis and peptic ulcer disease.

Gastro-oesophageal reflux disease and oesophagitis in pre-term, well infants and children with neuro-developmental disabilities

Congenital anomalies of gastrointestinal tract.

Functional bowel disorder (e.g. toddler's diarrhoea, irritable bowel syndrome, recurrent abdominal pain).

Know the differential diagnosis and be able to investigate a patient with acute abdominal pain

Acute gastroenteritis: be able to assess dehydration and start its management

Gastrointestinal bleeding: differential diagnosis and be able to resuscitate a patient in the acute phase of bleeding

Motility disorders.

Know the causes of intestinal obstruction

Recognise when a surgical opinion is required

- Be able to investigate pyloric stenosis, Hirschprung's disease and intussusception

- Know the differential diagnosis of bilious vomiting including NEC

Be able to differentiate and investigate abdominal masses

Chronic constipation: be able to differentiate between primary and secondary constipation

Pancreatitis.

Be able to manage iron deficiency anaemia

Be able to advice on post-operative management especially where rehabilitation with enteral or parenteral nutrition support is required



Be able to interpret a small bowel biopsy and an upper GI endoscopy  
Be able to interpret a Urea Breath Test  
Be able to interpret a pH study

## **2. Hepatology**

Know the common causes of prolonged neonatal jaundice

Know the differential diagnosis of conjugated hyperbilirubinemia of infancy

Be able to promptly recognize biliary atresia and know its clinical features and outcome.

Know the infectious causes of liver disease

Know about the metabolic liver disorders

Know the causes of chronic liver disease

Know the causes and management of acute liver failure.

Be able to investigate and treat acute and chronic liver disease

Know how to manage complications of end-stage liver disease.

Know when to refer to the paediatric liver unit, or for liver transplantation

Know the presentation of portal hypertension and its medical, endoscopic and surgical management

Know the differences between pre-hepatic and hepatic portal hypertension.

Be able to liaise with intensivists, liver transplant surgeons and transplant co-ordinators regarding management of acute liver failure and complications

## **3. Nutrition**

Understand the basis of normal infant/childhood feeding.

Assessment of feeding ability and nutritional status, including body mass index.

Know the physiology of nutrient digestion, absorption, metabolism and elimination

Recognition and management of feeding disorders including anorexia nervosa and bulimia.

Understand the mechanisms of malnutrition in gastrointestinal and liver disease.

Understand methods of nutritional support and their use.

Know the dietary requirements of children.

Know the short and long term effects of malnutrition in the infant, child and adolescent.

Knowledge of techniques for measuring dynamic nutritional parameters e.g. resting energy expenditure.

Understand the role of nutritional support teams in hospital and community settings, and the roles of individual team members

Know the different types of growth charts available and how to use them

Know the indications and contraindications for commencing enteral and parenteral nutritional support

Know the composition of different enteral feeds, and parenteral nutrition

Be able to devise a feeding management plan in conjunction with other team members for patients requiring home enteral tube feeding or parenteral nutrition

Know how to investigate and manage a parenterally fed patient with pyrexia

## **4. Investigations**

Understand the basis of tests of malabsorption, liver dysfunction, tests, oesophageal pH and luminal impedance monitoring and manometric studies.

Indications and usefulness of relevant imaging and endoscopic techniques.

## **Skills (See also Appendix B for Procedural Skills)**

### **1. Clinical Skills**

- i. Assessment of nutritional status of infants and children, including auxological measurement of height, weight, head circumference, skin fold thickness, mid-arm circumference
- ii. Assessment of obesity and its complications
- iii. Assessment of dehydration: planning fluid therapy.
- iv. Interpretation of plain X-ray films, contrast and other imaging studies such as US, EUS, CT, MRI, small bowel biopsy
- v. Management of enteral and parenteral nutrition.
- vi. Prescription of elimination diets.
- vii. Prescription of medication to diagnose and/or treat diseases of the gastrointestinal tract.

### **Management Skills**

- i. Conduct a clinical audit.
- ii. Manage admission policies, endoscopy lists etc.
- iii. Understanding of contracting and purchasing where appropriate
- iv. Organisation of post-graduate teaching programme.

### **Research Skills**

- i. Design of clinical trials including medical statistics
- ii. Data organisation and presentation
- iii. Computer literacy including conducting a literature database search

### **Attitudes**

- i. Understanding the need for multidisciplinary approach.
- ii. Understanding that investigations may be unpleasant, painful or frightening and that child and parents must be counselled in advance.
- iii. Develop communication skills with the child and parents to ensure their full understanding and willing participation of the care process.
- iv. Understanding the need to deliver compassionate care.
- v. Understand the particular needs of adolescents with regard to their independence and autonomy, compliance with treatment, and how this affects management of chronic conditions
- vi. Understand issues around transition from paediatric to adult care, and be able to contribute effectively to transitional care services

## **Appendix B**

### **TRAINING IN ENDOSCOPY AND RELATED PROCEDURES**

A fully trained paediatric gastroenterologist must have both diagnostic and therapeutic competence for the procedures outlined for the level 1 trainee. Advanced endoscopic procedures should be mastered by level 2 or level 3 trainees who seek to become experts in paediatric endoscopy. Competence in some of these procedures may require additional training that is not available in many paediatric gastroenterology training programs<sup>1</sup> and would not be a requirement for the exit certification in paediatric gastroenterology.

Table 1. Guidelines for endoscopic training in procedures: recommended minimum procedural numbers for achieving competence<sup>1</sup>.

	Recommended number*
<b>Level 1 : Routine Procedures</b>	
Upper Endoscopy (OGD)	
- OGD Diagnostic	100
- OGD with Foreign Body Removal <sup>a</sup>	10
Lower Endoscopy	
- Colonoscopy <sup>b</sup>	120
- Colonoscopy with snare polypectomy <sup>a</sup>	10
Therapeutic Endoscopy	15
- OGD with control of bleeding (variceal or non-variceal - various methods) <sup>c</sup>	
- Colonoscopy with control of bleeding - various methods <sup>c</sup>	
<b>Level 2 : Complex Procedures</b>	
Percutaneous endoscopic gastrostomy <sup>d</sup>	10
OGD with dilatation (guidewire and through the scope)	10
Pneumatic dilatation for achalasia	5
Wireless Capsule Endoscopy (WCE)	20
Endoscopic deployment WCE	5
Endoscopic placement of transpyloric feeding tubes/ catheters, including motility catheters	5
Enteroscopy using colonoscope	10
Colonoscopy with dilatation of stricture	5
Bravo pH capsule deployment	10
Motility studies; such as pH & pH impedance studies	20
Percutaneous liver biopsy	15
Rectal biopsy	10
<b>Level 3 : Advance Procedures</b>	
ERCP (diagnostic, therapeutic, includes sphincterotomy, dilatation of stricture, stent placement, stone extraction)	200
Endoluminal stent placement	10
Balloon enteroscopy	10
EUS	100

\*These numbers represent threshold numbers of procedures that are recommended to be performed and are adapted from recommendations of the 1999 NASPGHAN guidelines<sup>2</sup> for training in paediatric gastroenterology and the gastroenterology core curriculum, third edition,

published in 2007 by the American Association for the Study of Liver Diseases, the Accreditation Council for Graduate Medical Education, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy<sup>3,4</sup>.

The number represents a minimum, and it is understood that most trainees will require more (never less) than the stated number to meet the competency standards based on existing data. The majority of level 1 and level 2 procedures should be performed in paediatric patients defined as individuals younger than 21 years old. Initial training in level 3 procedures may occur primarily in adults, but dedicated paediatric experience is required to achieve competency in performance of the procedure in the paediatric age group.

<sup>a</sup>Therapeutic procedures may be included in overall count of procedures (eg, OGD, colonoscopy) to meet minimal threshold for competence.

<sup>b</sup>Separate training in flexible sigmoidoscopy is not required if a sufficient number of colonoscopy procedures to meet minimal standards have been obtained.

<sup>c</sup>Methods to control bleeding may include injection, band ligation, electrocautery (eg, heater probe, multipolar probe, argon plasma coagulator, loop application, haemostatic clips), or additional methods as they become available.

<sup>d</sup>Refers to the gastric portion of the percutaneous endoscopy gastrostomy tube placement.

## References

1. Alan M. Leichtner, Lynette A. Gillis, Sandeep Gupta, James Heubi, Marsha Kay, Michael R. Narkewicz, Elizabeth A. Rider, Paul A. Rufo, Thomas J. Sferra, Jonathan Teitelbaum, and the NASPGHAN Training Committee. NASPGHAN Guidelines for Training in Pediatric Gastroenterology. *J Pediatr Gastroenterol Nutr* 2013;56 (Suppl 1): S1 -38.
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