

Paediatric Gastroenterology, Hepatology and Nutrition

Level 3

Paediatrics Sub-specialty Syllabus

Version 1

Approved by the GMC for implementation from 1st August 2018

This document outlines the syllabus to be used by doctors completing completing Level 3 Paediatric Gastroenterology, Hepatology and Nutrition training in the United Kingdom training in the United Kingdom (UK). It accompanies the RCPCH Progress curriculum and assessment strategy.

This is Version 1.0. As the document is updated, version numbers will be changed, and content changes noted in the table below.

Version number	Date issued	Summary of changes

Introduction

This syllabus supports the completion of the RCPCH Progress curriculum, and should be used in conjunction with the curriculum document.

The purpose of the curriculum is to train doctors to acquire a detailed knowledge and understanding of health and illness in babies, children and young people. The curriculum provides a framework for training, articulating the standard required to work at Consultant level, and at key progression points during their training, as well as encouraging the pursuit of excellence in all aspects of clinical and wider practice.

The curriculum comprises of Learning Outcomes which specify the standard that trainees must demonstrate as they progress through training and ultimately attain a Certificate of Completion of Training (CCT). The syllabi support the curriculum by providing further instructions and guidance as to how the Learning Outcomes can be achieved and demonstrated.

Using the Syllabus

Paediatric trainees are required to demonstrate achievement of generic and sub-specialty or General Paediatric Learning Outcomes throughout their training period.

For all level 1 and level 2 trainees, there are 11 generic paediatric Learning Outcomes for each level. At level 3, there are a further 11 generic paediatric Learning Outcomes for all trainees, and several additional Learning Outcomes in either General Paediatrics or the GRID sub-specialty the trainee has been appointed into.

This syllabus contains 5 interlinked elements, as outlined in figure 1 which illustrates how each element elaborates on the previous one.

Elements of the Syllabus

The **Introductory Statement** sets the scene for what makes a Paediatric Gastroenterologist and Hepatologist.

The **Learning Outcomes** are stated at the beginning of each section. These are the outcomes which the trainee must demonstrate they have met to be awarded their Certificate of Completion of Training (CCT) in Paediatrics. Progress towards achievement of the Learning Outcomes is reviewed annually at the Annual Review of Competence Progression (ARCP).

Each Learning Outcome is mapped to the General Medical Council (GMC) Generic Professional Capabilities framework. Each trainee must achieve all the Generic Professional Capabilities to meet the minimum regulatory standards for satisfactory completion of training.

The **Key Capabilities** are mandatory capabilities which must be evidenced by the trainee, in their ePortfolio, to meet the Learning Outcome. Key Capabilities are therefore also mapped to the GMC Generic Professional Capabilities framework.

The **Illustrations** are examples of evidence and give the range of clinical contexts that the trainee may use to support their achievement of the Key Capabilities. These are intended to provide a prompt to the trainee and trainer as to how the overall outcomes might be achieved. They are not intended to be exhaustive, and excellent trainees may produce a broader portfolio or include evidence that demonstrates deeper learning. It is not expected that trainees provide ePortfolio evidence against every individual illustration (or a set quota); the aim of assessment is to provide evidence against every Key Capability.

The **Assessment Grid** indicates suggested assessment methods, which may be used to demonstrate the Key Capabilities. Trainees may use differing assessment methods to demonstrate each capability (as indicated in each Assessment Grid), but there must be evidence of the trainee having achieved all Key Capabilities.

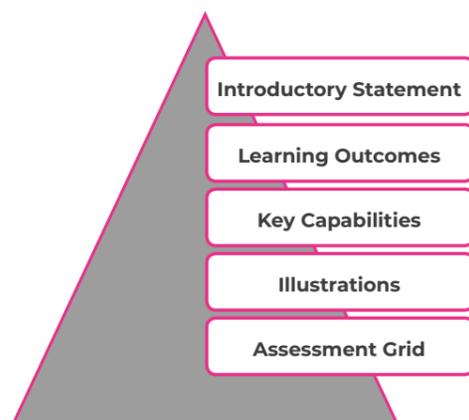


Figure 1: The 5 elements of the syllabus

Using the Syllabus with ePortfolio

Recording evidence in the ePortfolio to demonstrate progression against the learning outcomes and key capabilities can be done from any assessment or event in the ePortfolio.

At the end of any event or assessment, there is an opportunity to add tags, documents and comments. Expanding this by clicking “show more” will enable you to link your assessment to the curriculum items, where you will find the learning outcomes for each domain, key capabilities and example illustrations.

Trainees will therefore be able to track their progress in fulfilling the mandatory learning outcomes and key capabilities.



Paediatric Gastroenterology, Hepatology and Nutrition Introductory Statement

Introductory Statement

A Paediatric Gastroenterologist is a doctor who provides tertiary services for the diagnosis and long-term management of rare disorders and complex cases of more common disorders that affect the gastrointestinal tract. Gastroenterologists provide nutritional support for patients, including those with temporary or permanent intestinal failure, and manage services for home parenteral nutrition. Paediatric Hepatologists provide both tertiary and national hepatology services in designated centres. They diagnose and manage paediatric liver diseases, such as acute and chronic liver failure, and are co-located with transplant services to provide care for liver and small bowel transplantation patients.

Paediatric Gastroenterologists and Hepatologists often provide specialist advice in a model of shared care. They are co-located in regional units with key services such as paediatric surgery and paediatric intensive care. They understand the indications, benefits and risks of procedures for diagnostic evaluation and possess specialised skills in performing and interpreting the results of tests, such as gastrointestinal endoscopy and liver biopsy.

Sub-specialty Learning Outcomes (Gastroenterology)

Sub-specialty Learning Outcomes		GMC Generic Professional Capabilities
1.	Diagnoses, assesses and coordinates the management of inflammatory bowel disease (IBD) in all aspects of its care as part of a multidisciplinary team (MDT).	GPC 2, 3
2.	Diagnoses, assesses and manages both congenital and acquired conditions that may result in intestinal malabsorption and associated clinical disorders, as part of an MDT.	GPC 3, 5
3.	Manages the assessment of gastrointestinal bleeding, its risk stratification and safe, effective management as part of both a gastroenterology network and an MDT.	GPC 2, 3
4.	Demonstrates the confident management of a range of gastroenterology conditions, distinguishing functional gastrointestinal disorders from other gastrointestinal disease and providing safe and effective care.	GPC 2, 3, 5
5.	Performs high-level clinical and technical skills and procedures, while demonstrating understanding of the role of endoscopy, both diagnostic and therapeutic, in the management of children with gastrointestinal disorders.	GPC 5, 6

Sub-specialty Learning Outcome 1 (Gastroenterology)



Diagnoses, assesses and coordinates the management of inflammatory bowel disease (IBD) in all aspects of its care as part of a multidisciplinary team (MDT).	GPC 2, 3
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Key Capabilities

Conducts a detailed clinical assessment of a patient presenting with symptoms indicating gastrointestinal disease, selects the appropriate investigations in specific clinical situations, constructs a management plan and judges the suitability of the various avenues of treatment.	GPC 2, 3
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Illustrations

1.	Establishes the importance of a thorough grounding in basic science in providing effective management for patients with gastrointestinal disease.
2.	Demonstrates good knowledge of basic sciences relevant to gastrointestinal diseases in order to understand and manage such diseases effectively.
3.	Utilises appropriate pathological and radiological investigations to diagnose IBD and identifies relevant differential diagnoses (e.g. bacterial, viral or parasitic infections; functional disorders including IBS; food allergic colitis; eosinophilic colitis; drug-induced injury; vasculitis; immune dysregulation; chronic granulomatous disease and Bechet's disease).
4.	Uses appropriate criteria and scoring systems for assessing the severity and extent of IBD.
5.	Discusses the most effective treatment strategies with the family.
6.	Selects patient-specific treatment, including dietary treatment, aminosalicylates, corticosteroids and immune modulation.
7.	Makes a nutritional assessment in patients with IBD and plans nutritional support in conjunction with a dietitian.
8.	Formulates an individualised treatment plan for a patient with IBD and the necessary monitoring schedule to check for treatment efficacy and potential side effects.
9.	Uses antibiotic agents appropriately for specific conditions such as sepsis in a patient with IBD.
10.	Identifies the potential risks of drug treatment and recognises the adverse effects of non-steroidal anti-inflammatory drugs in a patient with IBD.
11.	Contributes to IBD MDT meetings.
12.	Recognises the potential complications of IBD, including surgical complications (e.g. intra-abdominal mass, perforation, strictures and fistulae), malnutrition, growth failure, delayed puberty and extra-intestinal manifestations such as osteoporosis.
13.	Takes appropriate action to investigate and adjust treatment as necessary, including referral for surgery and the involvement of other healthcare professionals such as an IBD nurse, stoma nurse, endocrinologist, or pain team.
14.	Demonstrates an understanding of adolescent medicine and knows how to manage the process of transition and, later, transfer to adult gastroenterology services.

Sub-specialty Learning Outcome 2 (Gastroenterology)



Diagnoses, assesses and manages both congenital and acquired conditions that may result in intestinal malabsorption and associated clinical disorders, as part of an MDT.	GPC 3, 5
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Key Capabilities

Demonstrates confident management of a range of gastroenterology conditions that may cause nutritional compromise including, diseases resulting from changes in intestinal absorption; disordered function of the liver and pancreas; disordered immunity/autoimmune disease; and infective gastrointestinal disease.	GPC 2, 3, 5
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Illustrations

1.	Chooses which investigations to use in chronic diarrhoea to diagnose infection and distinguishes between secretory and osmotic diarrhoea.
2.	Recognises and manages the following causes of early-onset protracted diarrhoea (and applies knowledge of the genetic implications of these conditions): <ul style="list-style-type: none"> • Congenital enteropathies, such as microvillus inclusion disease, tufting enteropathy and phenotypic diarrhoea of infancy • Transport disorders, such as glucose-galactose malabsorption, acrodermatitis enteropathica and sucrase-isomaltase deficiency • Protein-losing enteropathies, either congenital (e.g. congenital lymphangiectasia or congenital disorders of glycosylation) or acquired (e.g. post-Fontan procedure)
3.	Manages prolonged diarrhoea that arises from immune dysregulation, which includes: <ul style="list-style-type: none"> • Congenital (e.g. immunoglobulin deficiency, immunodysregulation polyendocrinopathy enteropathy X-linked syndrome [IPEX], severe combined immunodeficiency [SCID] and Omen's syndrome/hyper IgE) • Acquired – secondary to other diseases or treatments (e.g. post-organ transplant or due to human immunodeficiency virus [HIV] infection)
4.	Manages secretory diarrhoea, including that due to hormone-secreting tumours such as a VIPoma, mucosal compromise due to gut ischaemia, or infection.
5.	Recognises the presenting features of coeliac disease and knows the appropriate investigation (including the interpretation of serological tests), the indications for endoscopy and the variation in histological appearances on duodenal biopsies.
6.	Recognises when patients with coeliac disease require reassessment, the importance of adherence to a gluten-free diet, and how to perform a gluten challenge; advises on the testing of other family members for coeliac disease.
7.	Investigates suspected fabricated or induced diarrhoea.
8.	Manages pancreatic exocrine insufficiency including cystic fibrosis, chronic pancreatitis, Shwachman syndrome, and mitochondrial disease (e.g. Pearson's syndrome).

Sub-specialty Learning Outcome 3 (Gastroenterology)



Manages the assessment of gastrointestinal bleeding, its risk stratification and safe, effective management as part of both a gastroenterology network and an MDT.	GPC 2, 3
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Key Capabilities

Manages the causes of upper and lower gastrointestinal bleeding, referring appropriately for the investigational techniques required to make a diagnosis and identify the appropriate medical and surgical treatments.	GPC 8
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Illustrations

1.	Applies the principles of fluid resuscitation and arranges endoscopy at the appropriate time for the patient.
2.	Applies methods to secure haemostasis, recognises the signs of re-bleeding and liaises with other disciplines such as interventional radiology or surgery.
3.	Manages the causes and discusses the pathology of neoplastic disease of the gastrointestinal tract and liver.
4.	Manages the different types of bowel polyps, their management and the range of pre-malignant conditions; applies the principles of screening and surveillance in syndromes such as familial adenomatous polyposis and Peutz–Jeghers syndrome.
5.	Manages the gastrointestinal and nutritional complications in patients with non-gastrointestinal malignancy; knows how to diagnose and manage the adverse effects of chemotherapy and immunosuppression on the gut (e.g. mucositis, gastrointestinal bleeding and graft-versus-host disease post-stem cell transplantation).

Sub-specialty Learning Outcome 4 (Gastroenterology)



Demonstrates the confident management of a range of gastroenterology conditions, distinguishing functional gastrointestinal disorders from other gastrointestinal disease and providing safe and effective care.	GPC 2, 3, 5
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Key Capabilities

Identifies the key features of functional abdominal pain, the methods of clinical assessment and its longer-term management, including liaising with other professionals such as general paediatricians, clinical psychologists, child and adolescent mental health professionals and pain teams.	GPC 2, 3, 6
Identifies motility problems across the age spectrum, including children and young people with neurodisability, and coordinates their care with local paediatric services.	GPC 2, 3, 6
Carries out a thorough clinical assessment of disorders of the upper gastrointestinal tract.	GPC 2, 3, 6

Illustrations

1.	Describes the enteric nervous system and understands the manner in which drugs can modify its function.
2.	Describes the brain–gut axis and the role of psychological factors in the genesis of symptoms.
3.	Recognises the contribution of disordered gastrointestinal motility both to patients' symptoms and to their diseases.
4.	Demonstrates an understanding of the contemporary knowledge of the range of factors that control gastrointestinal motility, as well as the means by which symptoms arising from the gastrointestinal tract are perceived.
5.	Recognises the full spectrum of functional gastrointestinal disease across age groups (e.g. infantile regurgitation, aerophagia, rumination, abdominal pain, abdominal migraine, functional dyspepsia and cyclical vomiting).

6.	Recognises the range of clinical presentations of patients with IBS and the IBS diagnostic criteria, and manages IBS symptomatology.
7.	Assesses the degree to which functional gut problems can impair quality of life and affect families; involves patients in deciding among treatment options, self-management and how and when to refer to clinical psychology.
8.	Makes a differential diagnosis of nausea and vomiting (including functional problems such as rumination and cyclical vomiting syndrome) and knows how to investigate the symptoms.
9.	Recognises that bilious vomiting may reflect a surgical problem (e.g. malrotation or volvulus), a congenital cause (e.g. web or malrotation) or necrotising enterocolitis (NEC), and knows when to seek a surgical opinion.
10.	Manages the causes of constipation and can distinguish between idiopathic and secondary constipation.
11.	Manages the syndromes of disordered defaecation including infant dyschezia, retentive constipation and spurious diarrhoea; understands the range of treatment options including diet, drugs, behavioural interventions and the possible role of surgery.
12.	Recommends effective and judicious use of laxatives according to guidelines and coordinates ongoing care in secondary care setting and/or the community.
13.	Recognises and manages presentations and complications of Hirschsprung's disease and refers appropriately to a surgical team.
14.	Makes a thorough clinical assessment of gastro-oesophageal reflux in patients across the age spectrum, including in children and young people with neurodisability.
15.	Assesses, investigates and treats patients with dyspepsia, and recognises and manages the relationship of reflux to pharyngeal, laryngeal and respiratory symptoms as well as oesophagitis.
16.	Assesses a patient with dysphagia, including the use of endoscopy, contrast studies, and manometry where appropriate, and manages the condition appropriately.
17.	Diagnoses and manages upper gastrointestinal disorders including eosinophilic oesophagitis, gastroduodenal ulceration, Helicobacter pylori-related ulceration and achalasia.
18.	Interprets ambulatory pH and impedance monitoring.
19.	Discusses the medical treatment options for gastro-oesophageal reflux disease and the indications for surgery; describes the potential complications of surgery (e.g. gas bloat and dumping syndrome).

Sub-specialty Learning Outcome 5 (Gastroenterology)

Performs high-level clinical and technical skills and procedures, while demonstrating understanding of the role of endoscopy, both diagnostic and therapeutic, in the management of children with gastrointestinal disorders.

GPC 5, 6

Key Capabilities

Receives certification in gastrointestinal endoscopy through the Joint Advisory Group (JAG) Endoscopy Training System (JETS).

GPC 2, 3

Illustrations

1.	Applies the principles of case selection and knows the appropriate timing of endoscopy and colonoscopy.
2.	Manages the indications and contraindications for endoscopy and the implications of comorbidities (e.g. diabetes mellitus, critical illness and immune deficiency).
3.	Prepares a patient for ileo-colonoscopy and understands the safety and appropriateness of the procedure.
4.	Applies age-appropriate methods of patient preparation for ileo-colonoscopy, including dietary manipulation and prescription of bowel preparation.
5.	Communicates the risk of endoscopy to children and their families.
6.	Assesses capacity and involves children and young people in the process.
7.	Applies the latest consent guidelines and methods to assess competency for provision of informed consent for endoscopy.
8.	Understands endoscope design construction and maintenance.
9.	Selects the correct endoscopic equipment based on patient age and task required, can perform pre-procedure equipment checks and demonstrates problem-solving for equipment malfunction.
10.	Discusses the rationale for and performs safe pre- and post-operative checks, such as those included in the World Health Organisation (WHO) surgical safety checklist.
11.	Performs upper gastrointestinal endoscopy; intubates the duodenum and performs the J-manoeuvre to view the fundus.
12.	Performs ileo-colonoscopy; reaching the caecum and intubates the terminal ileum as required.
13.	Takes biopsies and other necessary actions as required; interprets the histological results of the biopsies with colleagues in histopathology.
14.	Documents and interprets endoscopy findings and produces an individualised report and management plan.
15.	Recognises and manages the indications, contraindications and complications of endoscopic polyp removal.
16.	Recognises the risks of foreign body ingestion, particularly button battery ingestion.

Sub-specialty Learning Outcomes (Nutrition)

Sub-specialty Learning Outcomes		GMC Generic Professional Capabilities
1.	Manages all aspects of reversible and irreversible intestinal failure in children.	GPC 2, 3, 5
2.	Manages children with complex nutritional needs requiring nutritional support.	GPC 2, 3, 5

Sub-specialty Learning Outcome 1 (Nutrition)



Manages all aspects of reversible and irreversible intestinal failure in children.	GPC 2, 3, 5
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Key Capabilities

Assesses, diagnoses, and manages patients with intestinal failure as part of an MDT, recognising, preventing and appropriately managing complications.	GPC 2, 3, 5
Works with a nutritional support team to establish patients on home parenteral nutrition and manages the process of advancing enteral nutrition and weaning off parenteral nutrition.	GPC 4, 5

Illustrations

1.	Supports families in completing the training programme to establish a patient on home parenteral nutrition; appreciates the wider role of health professionals in arranging successful discharge planning, funding, and liaising with family support groups (e.g. Patients on Intravenous and Nasogastric Nutrition Therapy [PINNT]); and achieves practical competencies, including safe central venous catheter care, connection and disconnection of parenteral nutrition, and dressing care.
2.	Discusses complex issues and queries when starting home parenteral nutrition openly and honestly with the patient and family, appreciating the difficulties for carers in managing parenteral nutrition in the home.
3.	Recognises the causes of secretory and osmotic diarrhoea and how to characterise these both clinically and using laboratory tests.
4.	Manages maldigestion and malabsorption, including the spectrum of causes (e.g. anatomical and functional short bowel syndrome, pancreatic insufficiency, cholestatic liver disease, mucosal disease such as enteropathies, protein-losing enteropathy, and prolonged or protracted diarrhoea).
5.	Recognises congenital gut disorders (e.g. enteropathies, transport disorders, immune dysregulation and severe motility disorders) and acquired pathologies (e.g. necrotising enterocolitis [NEC], gut resection, Crohn's disease) that may require nutritional support.
6.	Identifies the indications for and appropriate timing of non-transplant surgical options in patients with short bowel syndrome (e.g. intestinal lengthening, closure of stoma and plication).
7.	Discusses the mechanisms of intestinal adaptation, the time over which it occurs and how to assess; identifies when enteral nutrition is appropriate, how to balance provision of enteral nutrition and parenteral nutrition in patients with intestinal failure, and monitors the safety and efficacy of parenteral nutrition.
8.	Recognises and treats the potential complications of intestinal failure, including bacterial overgrowth.
9.	Makes a referral for consideration of a small intestinal (+/- liver) transplant and understands the risks of transplantation.
10.	Assesses nutritional/fluid requirements and prescribes appropriate and individualised amounts of parenteral nutrition with the team.
11.	Identifies and manages the long-term problems of parenteral nutrition, including provision and preservation of venous access; intestinal failure associated with liver disease (IFALD); recurrent central venous catheter-related sepsis; and the challenges of achieving normal development, linear and bone growth, and quality of life. Knows the indications for the insertion of tunnelled central venous catheters, the potential complications and understands when discharge home on parenteral nutrition is indicated.
12.	Manages the fluid, electrolyte and micronutrient disturbances associated with short bowel syndrome, high output stomas, enteropathies and protracted diarrhoea of infancy.

Sub-specialty Learning Outcome 2 (Nutrition)



Manages children with complex nutritional needs requiring nutritional support.	GPC 2, 3, 5
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Key Capabilities

Works as part of a nutritional support team in assessing and managing patients who require complex nutritional support in disease conditions such as IBD, critical illness, liver disease, cardiac disease, cystic fibrosis, feeding disorders and neurodevelopmental disability.	GPC 5
Formulates an individualised nutritional treatment plan in conjunction with dietetic colleagues (including dietary exclusions and substitutions) and monitors specific diseases (e.g. coeliac disease and multiple food allergies).	GPC 2, 3, 4, 5

Illustrations

1.	Applies the ethical and legal implications of provision, withdrawal and withholding of artificial nutrition support to advocate for the family.
2.	Counsels families of children with neurodisabling conditions about the benefits and risks of insertion of a gastrostomy tube or device for feeding.
3.	Advocates for patients under the care of other speciality teams who require nutritional assessment; advises colleagues which professionals to refer to in the Nutrition Support Team.
4.	Identifies any patients with faltering growth, significant weight loss and/or anorexia or those who require complex nutritional support; knows local referral pathways to professionals with specific expertise.
5.	Manages conditions that lead to abnormal energy requirements (e.g. cardiac, liver disease or critical illness).
6.	Discusses the normal nutrient requirements of growing infants and children (including estimates of energy and macro- and micro-nutrients), and how to perform a nutritional assessment (with appropriate tools) and dietary assessment; this includes knowledge of the clinical, haematological and biochemical indices of nutritional status.
7.	Applies knowledge of the aetiology and the clinical consequences of under- and over-nutrition (obesity) in the infant, child and adolescent to its management.
8.	Manages post-surgical patients, understanding how, why and where a stoma is formed, and recognises the functional difference between a jejunostomy, ileostomy and colostomy and the problems that can result from each (including high output from a stoma).
9.	Balances the benefits and risks of the methods of giving artificial nutritional support, including the indications and complications of enteral nutrition.
10.	Discusses special infant formulae and the indications for their use, including feeding composition and feeding in special circumstances (e.g. feeding preterm infants and patients with renal, cardiac, liver and metabolic diseases).
11.	Identifies who is at risk of refeeding syndrome and how to minimise such risks.
12.	Takes an allergy-focused history; diagnoses patients with single and multiple food allergies, and oversees nutritional management including dietary exclusions and substitutions.
13.	Assesses dietary intake and requirements in patients with IBD and provides nutritional support to maintain normal growth; recognises indications for treatment with exclusive liquid nutrition in Crohn's disease, nutritional support in IBD, and the different diets or feeds used to treat active IBD.
14.	Prescribes a gluten-free diet, ensures compliance and monitors children with coeliac disease.

Sub-specialty Learning Outcomes (Hepatology)

Sub-specialty Learning Outcomes		GMC Generic Professional Capabilities
1.	Competently manages children and families throughout the transplantation process.	GPC 2, 3, 5
2.	Manages children in the peri- and post-transplant periods.	GPC 2, 3, 5
3.	Competently manages children with acute liver failure.	GPC 2, 3, 5
4.	Provides expert advice at a national level on the initial management for children with acute liver failure.	GPC 2, 5
5.	Competently manages children with chronic and end-stage liver disease and the associated complications, alongside an MDT.	GPC 2, 3, 5, 6
6.	Competently manages different conditions of infantile cholestasis and has an awareness of the rare disorders associated with infantile cholestasis.	GPC 2, 3, 5
7.	Stabilises and safely manages children with acute gastrointestinal bleeding secondary to bleeding varices and portal hypertension.	GPC 2, 3, 5
8.	Demonstrates the technical skills required for the diagnosis and management of children with liver disease.	GPC 2, 3

Sub-specialty Learning Outcome 1 (Hepatology)

Competently manages children and families throughout the transplantation process.	GPC 2, 3, 5
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Key Capabilities

Understands the indications for liver transplantation and plans the process of transplant assessment for children requiring transplant as part of a wider MDT.	GPC 2, 3, 5
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Illustrations

1.	Discusses the principles of patient selection for liver transplantation (+/- kidney or small bowel transplantation) and establishes the importance of the timely involvement of the transplant team.
2.	Plans the process of transplant assessment for children requiring transplant and counsels families about the indications and risks of transplant.
3.	Presents patients for transplantation to the MDT.
4.	Discusses the ethical framework around patient indications and contraindications for organ transplantation.
5.	Explains the indications and contraindications for liver transplant in metabolic disorders.
6.	Recognises and investigates benign and malignant liver tumours and the indications for transplantation.

Sub-specialty Learning Outcome 2 (Hepatology)

Manages children in the peri- and post-transplant periods.	GPC 2, 3, 5
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Key Capabilities

Proficiently manages children in the peri- and post-operative periods.	GPC 2, 3, 5
Follows up on children post-transplant and identifies and manages transplant-related complications (rejection, post-transplant lymphoproliferative disorder [PTLD], graft-versus-host disease [GvHD] and vascular and biliary complications).	GPC 2, 3, 5

Illustrations

1.	Ensures appropriate outpatient care following liver transplant (+/- kidney and small bowel transplant).
2.	Identifies and manages transplant-related complications (rejection, PTLD, GvHD, vascular and biliary complications).
3.	Applies in-depth knowledge of immunosuppressive drugs used in transplantation, their pharmacology, indications, long-term effects, potential side effects and interactions with other drugs.

Sub-specialty Learning Outcomes 3 and 4 (Hepatology)

Competently manages children with acute liver failure.	GPC 2, 3, 5
Provides expert advice at a national level on the initial management for children with acute liver failure.	GPC 2, 5

Key Capabilities

Demonstrates proficiency in managing children with acute liver failure, and anticipates and identifies early complications.	GPC 2, 3, 5
Advises other centres on how to initiate first-line treatment for children with acute liver failure while arranging referral to a paediatric liver transplant unit.	GPC 5, 8
Recognises the progression of acute liver failure and when liver transplantation is indicated and contraindicated.	GPC 2, 3, 6

Illustrations

1.	Demonstrates knowledge of the causes of acute liver failure, including haemophagocytic lymphohistiocytosis, gestational alloimmune liver disease and mitochondrial disorders.
2.	Recognises the clinical manifestations of acute liver failure.
3.	Investigates for the different causes of acute liver failure.
4.	Applies knowledge of the indications and contraindications for liver biopsy in acute liver failure.
5.	Explains the pathophysiology of complications including cerebral oedema and hepatorenal syndrome.
6.	Explains the pathogenesis of hepatic encephalopathy and the factors that may precipitate the condition.
7.	Liaises with intensivists, liver transplant surgeons and transplant co-ordinators regarding the management of acute liver failure.
8.	Counsels families about the outcome and prognosis of acute liver failure, recognising the progression of acute liver failure and when liver transplantation is indicated and contraindicated.

Sub-specialty Learning Outcome 5 (Hepatology)



Competently manages children with chronic and end-stage liver disease and the associated complications, alongside an MDT.	GPC 2, 3, 5, 6
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Key Capabilities

Works effectively as part of an MDT and demonstrates clear leadership skills in the diagnosis and management of children with chronic and end-stage liver disease.	GPC 5
Investigates the causes of cirrhosis and chronic liver diseases.	GPC 2, 3, 5
Manages the complications of chronic liver disease, including portal hypertension.	GPC 2, 3, 5

Illustrations

1.	Explains the mechanisms, clinical presentations and complications of chronic liver disease.
2.	Recognises and objectively assesses nutritional deficiencies in children with chronic liver disease, and understands the indications for enteral or parenteral support and their limitations.
3.	Explains the pathophysiology, clinical picture and presentation of portal hypertension.
4.	Explains the role of different imaging modalities in investigating children with portal hypertension.
5.	Formulates acute and long-term management plans for children with gastrointestinal bleeding due to portal hypertension.
6.	Discusses the indications and contraindications for a transjugular intra-hepatic portosystemic shunt (TIPS) or surgical shunt surgery in children with portal hypertension and gastrointestinal bleeding.
7.	Manages hepatorenal and hepatopulmonary syndrome.
8.	Describes the different causes of ascites in children with liver disease and can manage ascites and spontaneous bacterial peritonitis.
9.	Manages metabolic conditions affecting the liver.
10.	Manages autoimmune liver disease (including extra-hepatic manifestations) and interprets immunological profiles related to auto-immune liver disorders, especially atypical patterns.
11.	Describes the factors associated with the development of and how to manage children with intestinal failure associated with liver disease (IFALD), and works closely with an MDT (surgeons, gastroenterologists and dieticians).
12.	Manages the liver complications of immunodeficiency, including in the post-chemotherapy setting.
13.	Interprets screening tests used to detect hepatotropic viruses and is aware of available treatment options for viral hepatitis B and C.
14.	Identifies the various presentations of hepatic vascular abnormalities.
15.	Explains the underlying pathophysiology and manages children presenting with suspected hepatic outflow obstruction (Budd–Chiari syndrome and veno-occlusive disease).
16.	Explains the causes and complications of gallbladder stones.
17.	Identifies the aetiology and the potential complications of acute and chronic pancreatitis, monitors the potential effects of pancreatic exocrine insufficiency and manages pancreatic enzyme replacement therapy.

Sub-specialty Learning Outcome 6 (Hepatology)



Competently manages different conditions of infantile cholestasis and has an awareness of the rare disorders associated with infantile cholestasis.	GPC 2, 3, 5
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Key Capabilities

Demonstrates proficiency in the diagnosis and management of infantile cholestasis.	GPC 2, 3, 5, 6
Recognises the complications associated with infantile cholestasis.	GPC 2, 3, 5, 6
Advises on the urgent need for certain cases to be referred to a liver centre.	GPC 2, 3, 5, 8

Illustrations

1.	Recognises the causes of intra- and extra-hepatic cholestasis, the pathophysiology and genetics.
2.	Initiates appropriate investigations and a medical treatment plan for infantile cholestasis and understands the urgent need for certain cases of infantile cholestasis to be referred to a liver centre.
3.	Interprets liver biochemistry, ultrasound findings and biopsy results in infantile cholestasis and understands their importance and limitations in helping to reach a diagnosis.
4.	Manages children with biliary atresia, counsels families about a new diagnosis of biliary atresia and understands the principles of the Kasai porto-enterostomy.
5.	Applies the principles of cholangitis, pruritus and failed adequate bile drainage in children post-Kasai, and identifies progression to chronic liver disease and the need for liver transplant.
6.	Manages children with pruritus secondary to liver disease and prescribes anti-pruritus medications in children with cholestasis.
7.	Assesses children for different types of biliary diversion surgery and explains their indications and contraindications.
8.	Advises on the management of children with pathological causes of unconjugated jaundice and understands the associated risks.
9.	Recognises and objectively assesses nutritional deficiencies in cholestatic children and competently manages those deficiencies.

Sub-specialty Learning Outcome 7 (Hepatology)



Stabilises and safely manages children with acute gastrointestinal bleeding secondary to bleeding varices and portal hypertension.	GPC 2, 3, 5
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Key Capabilities

Competently initiates management for children with acute gastrointestinal bleeding secondary to portal hypertension.	GPC 2, 3, 5, 6
Demonstrates proficiency in stabilising children with acute gastrointestinal bleeding and prepares them for endoscopy while leading their management.	GPC 2, 3, 5, 6

Illustrations

1.	Applies an understanding of the role of pharmacotherapy in managing acute gastrointestinal bleeding.
2.	Performs an interventional upper gastrointestinal endoscopy (with variceal banding +/-sclerotherapy).
3.	Uses a Sengstaken tube in refractory variceal bleeding.
4.	Explains the role of the emergency transjugular intra-hepatic portosystemic shunt in refractory variceal bleeding.
5.	Advises other centres on how to initiate first-line treatment for gastrointestinal bleeding and when it is safe to transfer the child to a liver centre for definitive treatment.

Sub-specialty Learning Outcome 8 (Hepatology)

Demonstrates the technical skills required for the diagnosis and management of children with liver disease.	GPC 2, 3
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Key Capabilities

Uses liver biopsy as a tool for the diagnosis and management of children with liver disease and identifies the risks, complications and contraindications of liver biopsy.	GPC 2, 3
Understands the indications and risks of variceal band ligation and sclerotherapy.	GPC 2, 3

Illustrations

1.	Performs and interprets a liver biopsy.
2.	Performs abdominal paracentesis.
3.	Explains the indications and contraindications for endoscopy and the implications of comorbidities (e.g. diabetes mellitus and critical illness).
4.	Applies medical and legal issues of consent for procedures.

Assessment Grid – Gastroenterology

This table suggests assessment tools which may be used to assess the Key Capabilities for these Learning Outcomes. This is not an exhaustive list, and trainees are permitted to use other methods within the RCPCH Assessment Strategy to demonstrate achievement of the Learning Outcome, where they can demonstrate these are suitable.

Key Capabilities	Assessment / Supervised Learning Event suggestions									
	Paediatric Mini Clinical Evaluation (ePaed Mini-CEX)	Paediatric Case-based Discussion (ePaed Cbd)	Directly Observed Procedure / Assessment of Performance (DOP/AoP)	Acute Care Assessment Tool (ACAT)	Discussion of Correspondence (DOC)	Clinical Leadership Assessment Skills (LEADER)	Handover Assessment Tool (HAT)	Paediatric Multi-Source Feedback (ePaed MSF)	Paediatric Carers for Children Feedback (Paed CCF)	Other
Conducts a detailed clinical assessment of a patient presenting with symptoms indicating gastrointestinal disease, selects the appropriate investigations in specific clinical situations, constructs a management plan and judges the suitability of various avenues of treatment.	✓	✓			✓	✓		✓		
Demonstrates confident management of a range of gastroenterology conditions that may cause nutritional compromise including, diseases resulting from changes in intestinal absorption; disordered function of the liver and pancreas; disordered immunity/autoimmune disease; and infective gastrointestinal disease.	✓	✓				✓		✓		
Manages the causes of upper and lower gastrointestinal bleeding, referring appropriately for the investigational techniques required to make a diagnosis and identify the appropriate medical and surgical treatments.	✓	✓		✓		✓		✓		
Identifies the key features of functional abdominal pain, the methods of clinical assessment and its longer-term management, including liaising with other professionals such as general paediatricians, clinical psychologists, child and adolescent mental health professionals and pain teams.	✓	✓		✓		✓		✓		
Identifies motility problems across the age spectrum, including children and young people with neurodisability, and coordinates their care with local paediatric services.	✓	✓					✓	✓		
Carries out a thorough clinical assessment of disorders of the upper gastrointestinal tract.	✓	✓				✓	✓	✓		
Receives certification in gastrointestinal endoscopy through the Joint Advisory Group (JAG) Endoscopy Training System (JETS).	✓	✓					✓			

Assessment Grid – Nutrition

This table suggests assessment tools which may be used to assess the Key Capabilities for these Learning Outcomes. This is not an exhaustive list, and trainees are permitted to use other methods within the RCPCH Assessment Strategy to demonstrate achievement of the Learning Outcome, where they can demonstrate these are suitable.

Key Capabilities	Assessment / Supervised Learning Event suggestions								
	Paediatric Mini Clinical Evaluation (ePaed Mini-CEX)	Paediatric Case-based Discussion (ePaed Cbd)	Directly Observed Procedure / Assessment of Performance (DOP/Aop)	Acute Care Assessment Tool (ACAT)	Discussion of Correspondence (DOC)	Clinical Leadership Assessment Skills (LEADER)	Handover Assessment Tool (HAT)	Paediatric Multi Source Feedback (ePaed MSF)	Other
Assesses, diagnoses, and manages patients with intestinal failure as part of an MDT, recognising, preventing and appropriately managing complications.	✓	✓				✓		✓	
Works with a nutritional support team to establish patients on home parenteral nutrition and manages the process of advancing enteral nutrition and weaning off parenteral nutrition.	✓	✓				✓		✓	
Works as part of a nutritional support team in assessing and managing patients who require complex nutritional support in disease conditions such as IBD, critical illness, liver disease, cardiac disease, cystic fibrosis, feeding disorders and neurodevelopmental disability.	✓	✓				✓		✓	
Formulates an individualised nutritional treatment plan in conjunction with dietetic colleagues (including dietary exclusions and substitutions) and monitors specific diseases (e.g. coeliac disease and multiple food allergies).	✓	✓				✓		✓	

Assessment Grid – Hepatology

This table suggests assessment tools which may be used to assess the Key Capabilities for these Learning Outcomes. This is not an exhaustive list, and trainees are permitted to use other methods within the RCPCH Assessment Strategy to demonstrate achievement of the Learning Outcome, where they can demonstrate these are suitable.

Key Capabilities	Assessment / Supervised Learning Event suggestions								
	Paediatric Mini Clinical Evaluation (ePaed Mini-CEX)	Paediatric Case-based Discussion (ePaed Cbd)	Directly Observed Procedure / Assessment of Performance (DOP/Aop)	Acute Care Assessment Tool (ACAT)	Discussion of Correspondence (DOC)	Clinical Leadership Assessment Skills (LEADER)	Handover Assessment Tool (HAT)	Paediatric Multi Source Feedback (ePaed MSF)	Other
Understands the indications for liver transplantation and plans the process of transplant assessment for children requiring transplant as part of a wider MDT.	✓	✓				✓		✓	
Proficiently manages children in the peri- and post-operative periods.	✓	✓		✓		✓		✓	
Follows up on children post-transplant and identifies and manages transplant-related complications (rejection, post-transplant lymphoproliferative disorder [PTLD], graft-versus-host disease [GvHD] and vascular and biliary complications).	✓	✓				✓		✓	✓
Demonstrates proficiency in managing children with acute liver failure, and anticipates and identifies early complications.	✓	✓				✓		✓	
Advises other centres on how to initiate first-line treatment for children with acute liver failure while arranging referral to a paediatric liver transplant unit.	✓	✓					✓	✓	
Recognises the progression of acute liver failure and when liver transplantation is indicated and contraindicated.		✓				✓		✓	
Works effectively as part of an MDT and demonstrates clear leadership skills in the diagnosis and management of children with chronic and end-stage liver disease.	✓	✓				✓	✓	✓	
Investigates the causes of cirrhosis and chronic liver diseases.	✓	✓				✓			
Manages the complications of chronic liver disease, including portal hypertension.	✓	✓				✓			

Key Capabilities	Assessment / Supervised Learning Event suggestions									
	Other	Paediatric Carers for Children Feedback (Paed CCF)	Paediatric Multi Source Feedback (ePaed MSF)	Handover Assessment Tool (HAT)	Clinical Leadership Assessment Skills (LEADER)	Discussion of Correspondence (DOC)	Acute Care Assessment Tool (ACAT)	Directly Observed Procedure / Assessment of Performance (DOP/AoP)	Paediatric Case-based Discussion (ePaed Cbd)	Paediatric Mini Clinical Evaluation (ePaed Mini-CEX)
Demonstrates proficiency in the diagnosis and management of infantile cholestasis.		✓			✓				✓	✓
Recognises the complications associated with infantile cholestasis.					✓				✓	✓
Advises on the urgent need for certain cases to be referred to a liver centre.							✓		✓	✓
Competently initiates management for children with acute gastrointestinal bleeding secondary to portal hypertension.			✓		✓				✓	✓
Demonstrates proficiency in stabilising children with acute gastrointestinal bleeding and prepares them for endoscopy while leading their management.			✓		✓		✓		✓	✓
Utilises liver biopsy as a tool for the diagnosis and management of children with liver disease and identifies the risks, complications and contraindications of liver biopsy.					✓				✓	✓
Understands the indications and risks of variceal band ligation and sclerotherapy.					✓				✓	✓



