RCPCH Progress

Paediatric curriculum for excellence

Paediatric Diabetes and Endocrinology

Sub-specialty Syllabus

Version 2
Approved by the GMC for implementation from 1 September 2021

RCPCH
Royal College of Paediatrics and Child Health
Leading the way in Children's Health

This document outlines the syllabus to be used by doctors completing Paediatric Diabetes and Endocrinology training in the United Kingdom (UK). It accompanies the RCPCH Progress curriculum and Assessment Strategy.

This is Version 2. 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
2	September 2021	Document reviewed as part of the Shape of Paediatrics Training review. 'Using the Syllabus with ePortfolio' (page 5) updated. Learning Outcome 1, Genetics Illustration updated and six additional Illustrations added.

Introduction

This syllabus supports the completion of the RCPCH Progress curriculum and should be used 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, through 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 Learning Outcomes specifying the standard trainees must demonstrate to progress in training and attain a Certificate of Completion of Training (CCT). The syllabi supports the curriculum by providing further instructions and guidance on 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 sub-specialty to which the trainee has been appointed.

This syllabus contains five 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 Diabetes and Endocrinology Paediatrician.

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.

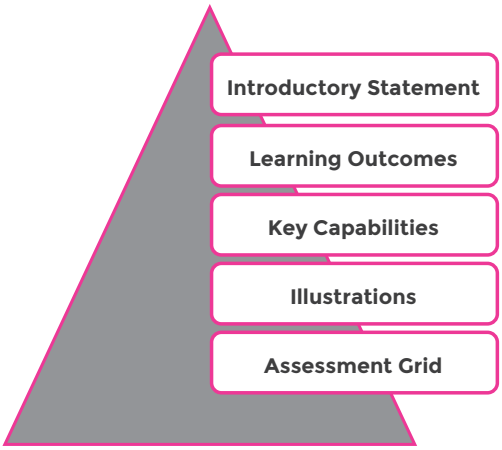

Figure 1: The five elements of the syllabus

Using the Syllabus with ePortfolio

The ePortfolio is used to demonstrate a trainee's progression using assessments, development logs and reflections. Events should be linked to the Progress curriculum specifically against the key capabilities at the appropriate level.

Further guidance on using the ePortfolio is available on our website: https://www.rcpch.ac.uk/resources/rcpch-eportfolio-kaizen-guidance-trainees

Paediatric Diabetes and Endocrinology Introductory Statement

Introductory Statement

A Paediatric Endocrinologist is a doctor who has special expertise in looking after children and young people with hormone disorders. These can affect growth or pubertal development and have significant effects on a child and young person's physical and emotional well-being. The conditions managed can include normal variations in growth and puberty; over- or under-activity of the pituitary, thyroid and adrenal glands; endocrine-related obesity; more complex disorders of sex development; and metabolic bone disease.

Paediatric Endocrinologists link closely with other tertiary specialties, including surgeons, gynaecologists, geneticists and adult endocrinologists, to provide coordinated and comprehensive care. Many Paediatric Endocrinologists are actively involved in clinical research.

Paediatric Endocrinologists are also involved in managing children and young people with diabetes mellitus. This entails developing expertise in optimising blood glucose control to minimise future complications, intensive insulin regimes, continuous glucose monitoring systems (CGMS) and continuous subcutaneous insulin infusions (CSII).

Sub-specialty Learning Outcomes

	Sub-specialty Learning Outcomes	GMC Generic Professional Capabilities
1.	Manages common endocrine conditions and demonstrates awareness of rare endocrine disorders.	GPC 3, 5
2.	Manages all aspects of type 1 and type 2 diabetes mellitus and rare forms of diabetes.	GPC 3, 5
3.	Provides expert advice at a regional level for the management of endocrine conditions and diabetes mellitus.	GPC 5, 6, 8
4.	Implements and maintains safe and effective practice related to endocrinology and diabetes mellitus.	GPC 3, 5, 6, 9

Sub-specialty Learning Outcome 1

Manages common endocrine conditions and demonstrates an awareness of rare endocrine disorders.	GPC 3, 5

Key Capabilities

Demonstrates proficiency in the investigation and management of common endocrine disorders, including growth, puberty, thyroid, adrenal and pituitary disorders.	GPC 3
Demonstrates an understanding of the management of less common endocrine disorders, eg disorders of sexual development (DSD), bone and calcium disorders and late effects; participates in a range of endocrine sub-specialties.	GPC 3, 5
Demonstrates skills and manages all acute aspects of endocrine disorders, eg an adrenal crisis, diabetic ketoacidosis (DKA), hypoglycaemia and fluid and electrolyte imbalance.	GPC 3, 5

Illustrations

Growth disorders:	
1.	Demonstrates expertise in the investigation and management of short stature.
2.	Manages syndromic causes of short stature, including Turner, Noonan and Russell-Silver syndromes.
3.	Monitors the efficacy and safety of growth hormone therapy for various indications (including non-GH-deficient patients, Prader-Willi Syndrome [PWS], Small-for-Gestational-Age [SGA]) and familiar with various growth hormone devices.
4.	Diagnoses and manages tall stature, including Marfan and Klinefelter syndromes.
5.	Applies knowledge of bone age and its limitations.
6.	Applies knowledge of the diagnosis and management of Insulin-like Growth Factor-1 (IGF-1) deficiency.
Puberty:	
1.	Investigates and manages delayed puberty (central and gonadal).
2.	Induces, monitors and treats delayed puberty to full maturity.
3.	Investigates and manages precocious puberty (central and gonadal).
4.	Investigates and manages puberty variants, eg thelarche, adrenarche.
Adrenal and DSD:	
1.	Diagnoses and manages hypoadrenalism, including Congenital Adrenal Hyperplasia (CAH) and Addison's disease.
2.	Investigates and manages hypercortisolism (central and adrenal), including iatrogenic causes.
3.	Diagnoses and manages 46XX DSD and recognises the differential diagnosis.
4.	Diagnoses and manages cryptorchidism, micropenis and hypospadias.
5.	Teaches and trains parents on emergency hydrocortisone management.
6.	Demonstrates clearly the ability to manage acute adrenal crisis, stabilises patients on hydrocortisone therapy and interconvert between types of steroids.
7.	Applies knowledge of antenatal management of CAH.
Pituitary:	
1.	Manages hypopituitarism (congenital and acquired).

Bone and calcium disorders:	
1.	Diagnoses and manages osteoporosis in children and young people, eg osteogenesis imperfecta.
2.	Diagnoses and manages skeletal dysplasia.
3.	Understands the indications, benefits and limitations of bone densitometry.
4.	Diagnoses and manages hypoparathyroidism.
5.	Demonstartaes an understanding of the management of hyperparathyroidism and pseudohypoparathyroidism.
6.	Manages hypocalcaemia and hypercalcaemia.
7.	Diagnoses and manages various forms of rickets.
Obesity:	
1.	Diagnoses and manages childhood obesity, including syndromal, genetic and endocrine causes and identifies and manages comorbidities.
2.	Diagnoses and manages menstrual problems and hirsutism in girls, including polycystic ovary syndrome (PCOS) and menorrhagia.
Sodium and fluid balance:	
1.	Diagnoses and manages diabetes insipidus (DI).
2.	Manages fluid balance during and after cerebral surgery, including DI, the syndrome of inappropriate antidiuretic hormone secretion (SIADH) and the cerebral salt wasting syndrome.
3.	Demonstrates the ability to assess hyponatraemia and hypernatraemia and provides management plans.
4.	Diagnoses and manages hypoaldosteronism.
Endocrine tumours and late effects:	
1.	Investigates and manages endocrine tumours (eg craniopharyngiomas, adrenal tumours, prolactinomas, multiple endocrine neoplasia [MEN]) as part of a multidisciplinary team (MDT).
2.	Manages the long-term endocrine sequelae of oncological disorders, treatment (surgery, radiotherapy, chemotherapy) and haemoglobinopathies.
Thyroid disorders:	
1.	Demonstrates expertise in the management of congenital hypothyroidism, including initiation of treatment and knowledge of the neonatal thyroid screening guidelines.
2.	Diagnoses and manages thyrotoxicosis and recognises different treatment regimens.
3.	Demonstrates the ability to diagnose and manage autoimmune hypothyroidism and subclinical hypothyroidism.
4.	Diagnoses and manages neonatal thyrotoxicosis.
5.	Investigates thyroid nodules.

Auxology:	
1.	Measures children and young people accurately (weight, height, sitting height, arm span).
2.	Calculates decimal age, height velocity and standard deviation (SD) scores for assessing growth.
3.	Uses disease-specific growth charts.
Genetics:	
1.	Understands the genetic investigations that would influence management and inform family screening and counselling, eg MEN, congenital hyperinsulinism and CAH.
2.	Understands the available modalities of genetic testing and uses this knowledge to select and consent for the appropriate genetic test for a child and young person with an Endocrine disorder.
3.	Understands the ACMG guidelines for variant classification and uses this knowledge as required.
4.	Demonstrates understanding and explains simply the principles of autosomal recessive, dominant, X-linked inheritance patterns.
5.	Familiarity with clinical situations in which molecular testing may be an appropriate first line investigation and selection of appropriate samples for testing.
6.	Understand issues regarding informed consent for DNA testing and whole exome/ genome testing.
7.	Understand the available modalities of genetic testing (single gene/variant, gene panel, exome, genome).
Miscellaneous:	
1.	Diagnoses and manages patients with persistent hypoglycaemia and contacts quaternary centres, if appropriate, eg congenital hyperinsulinism.
2.	Applies knowledge on the management of McCune-Albright syndrome.
3.	Applies knowledge on the association of various endocrine disorders, eg polyglandular endocrine autoimmune syndromes.
4.	Considers the indications for imaging in endocrine disorders.
5.	Interprets common pituitary Magnetic Resonance Imaging (MRI) abnormalities and liaises with neuroradiology.
Other:	
1.	Participates in the following clinics: • gynaecology • bone and calcium and late effects clinics • endocrine transition clinics • adult endocrine clinics

Sub-specialty Learning Outcome 2

Manages all aspects of type 1 and type 2 diabetes mellitus and rare forms of diabetes.	GPC 3, 5

Key Capabilities

Demonstrates proficiency in the management of various aspects of care in a child and young person with diabetes mellitus (including rare forms of diabetes).	GPC 3, 5

Illustrations

1.	Demonstrates expertise in the recognition and management of DKA, including knowledge of the evidence base.
2.	Demonstrates the ability to manage diabetic emergencies, such as missed or incorrect insulin or pump failure.
3.	Advises parents, children and young people on the management of diabetes-related hypoglycaemia.
4.	Monitors injection sites, detects early signs of complications and plans appropriate screening in patients with type 1 diabetes.
5.	Uses various glucose monitoring devices.
6.	Recognises the indications for continuous glucose monitoring and interprets the results.
7.	Uses insulin pumps and continuous glucose monitoring systems.
8.	Interprets downloads and advises patients and carers accordingly.
9.	Recognises how to investigate and treat transient and permanent neonatal diabetes.
10.	Understands glycated haemoglobin analysis and recognises its significance in evaluating diabetic control.
11.	Manages the impact of diabetes on education and psychosocial well-being.
12.	Proficient in the management of diabetic control at the time of surgery.
13.	Investigates and treats maturity onset diabetes of the young.
14.	Diagnoses and manages type 2 diabetes.
15.	Manages cystic fibrosis-related diabetes.
16.	Proficient with intensive insulin regimes in diabetes, including a basal bolus regime.
17.	Provides advice about diet in diabetes and proficient in at least one meal-planning method, eg carbohydrate (CHO) counting.

Sub-specialty Learning Outcome 3

Provides expert advice at a regional level for the management of endocrine conditions and diabetes mellitus.	GPC 5, 6, 8

Key Capabilities

Supports regional paediatric units in the management of acute and long-term endocrine conditions and diabetes mellitus.	GPC 1, 2, 3, 5, 8
Supports teaching and training related to endocrinology and diabetes at the regional level.	GPC 8

Illustrations

1.	Provides advice and support to other professionals in the management of diabetes mellitus.
2.	Provides advice and support to other professionals in the management of acute and long term endocrine conditions.

Sub-specialty Learning Outcome 4

Implements and maintains safe and effective practice related to endocrinology and diabetes mellitus.	GPC 3, 5, 6, 9

Key Capabilities

Demonstrates participation in establishing effective and safe practice, eg development of guidelines, Continuing Professional Development (CPD) and audits.	GPC 5, 6, 8

Illustrations

1.	Participates in diabetes and endocrine audits and journal clubs.
2.	Attends and presents clinical cases or research findings at professional meetings, eg the British Society for Paediatric Endocrinology (BSPED), the European Society for Paediatric Endocrinology (ESPE), the Association of Children's Diabetes Clinicians (ACDC).
3.	Attends endocrine and diabetes 'teaching schools', eg ESPE summer schools.

Assessment Grid

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
Demonstrates proficiency in the investigation and management of common endocrine disorders, including growth, puberty, thyroid, adrenal and pituitary disorders.	✓	✓			✓	✓				
Demonstrates an understanding of the management of less common endocrine disorders, eg disorders of sexual development (DSD), bone and calcium disorders and late effects; participating in a range of endocrine sub-specialties.	✓	✓			✓	✓		✓		Fulfils training criteria as per SPIN diabetes module
Demonstrates skills and manages all acute aspects of endocrine disorders, eg an adrenal crisis, diabetic ketoacidosis (DKA), hypoglycaemia and fluid and electrolyte imbalance.	✓	✓	✓		✓					
Demonstrates proficiency in the management of various aspects of care in a child and young person with diabetes mellitus (including rare forms of diabetes).	✓	✓			✓	✓		✓		Evidence of teaching these topics
Supports regional paediatric units in the management of acute and long-term endocrine conditions and diabetes mellitus.	✓	✓			✓			✓		
Supports teaching and training related to endocrinology and diabetes at the regional level.	✓	✓			✓	✓		✓		
Demonstrates participation in establishing effective and safe practice, eg development of guidelines, Continuing Professional Development (CPD) and audits.	✓	✓			✓	✓		✓		