The Royal Australasian College of Physicians

Endocrinology

Advanced Training Curriculum

Adult Medicine Division

ANZBMS

The Royal Australasian College of Physicians

Physician Readiness for Expert Practice (PREP) Training Program

Endocrinology Advanced Training Curriculum

TO BE USED IN CONJUNCTION WITH:

Basic Training Curriculum – Adult Internal Medicine

Professional Qualities Curriculum

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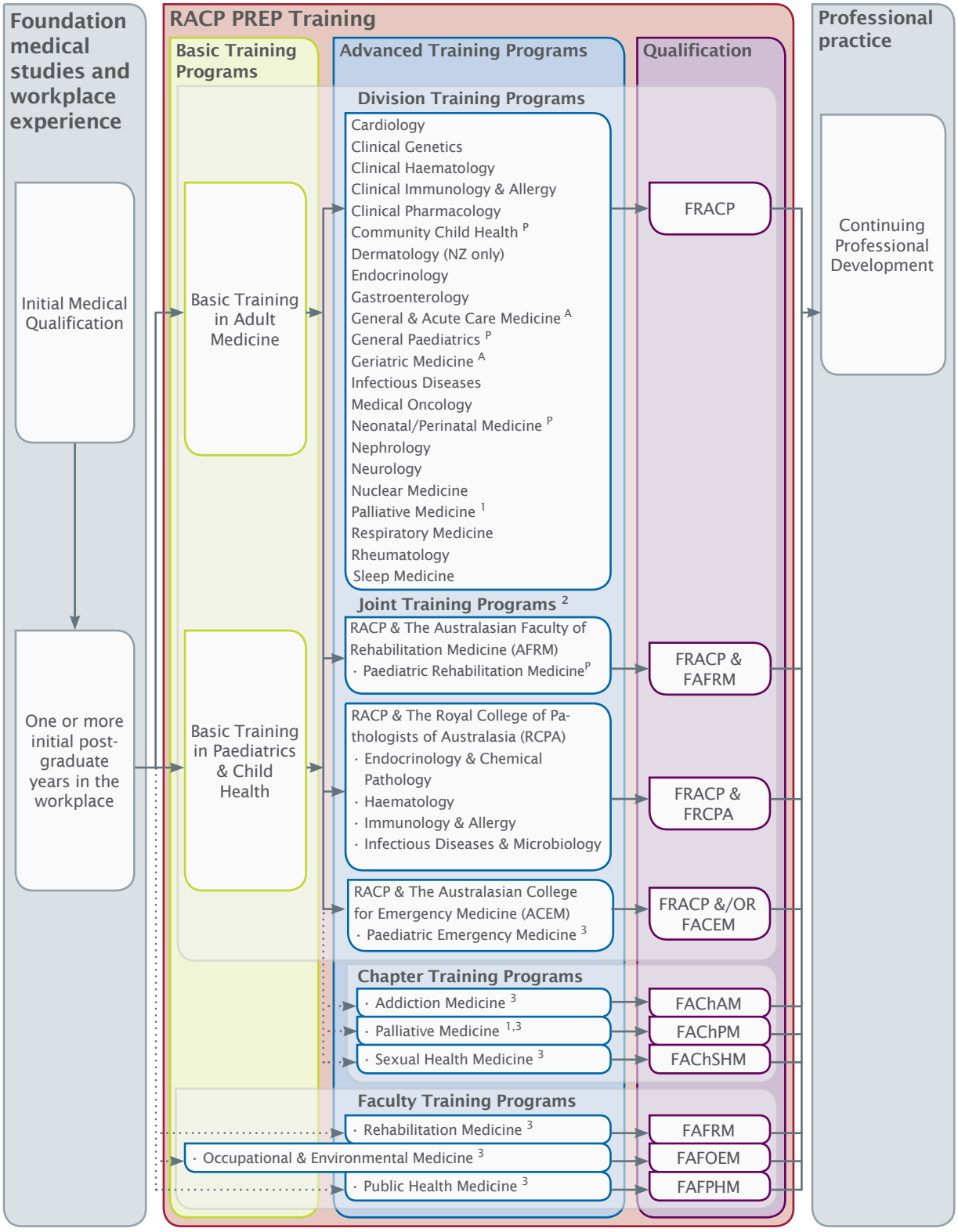
Please note: No Domains, Themes or Learning Objectives have been updated for this edition; design changes ONLY.

RACP FELLOWSHIP TRAINING PATHWAYS AND THE CONTINUUM OF LEARNING



P Trainees must complete Basic Training in Paediatrics & Child Health to enter this program.
A Trainees must complete Basic Training in Adult Medicine to enter this program.
1 Trainees who have entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will be awarded FRACP upon completion and may subsequently be awarded FAChPM. Trainees who have NOT entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will only be awarded FAChPM upon completion.
2 The Child & Adolescent Psychiatry Joint Training Program with the Royal Australian and New Zealand College of Psychiatrists (RANZCP) is currently under review by the RACP and RANZCP and closed to new entrants at present.
3 Alternative entry requirements exist for these training programs; please see the corresponding PREP Program Requirements Handbook for further information.

NB1: This diagram only depicts training programs that lead to Fellowship. Please see the RACP website for additional RACP training programs.
NB2: For further information on any of the above listed training programs, please see the corresponding PREP Program Requirements Handbook.

OVERVIEW OF THE SPECIALTY

Endocrinology is the study of hormones and hormone producing tissues, both their normal physiology and their pathophysiology. The specialty of clinical endocrinology encompasses the diagnosis and management of disorders of the endocrine system. Hormones from the body's major gland systems (thyroid, pancreas, gonads, adrenal and pituitary) regulate growth, metabolism, blood pressure and reproduction, as well as diverse other functions. Endocrinologists assess and diagnose endocrine disorders, provide treatment, perform diagnostic and laboratory analyses, and conduct basic and applied research in a wide range of humoral and metabolic conditions.

The spectrum of endocrine disorders includes diabetes and its complications; thyroid, pituitary and adrenal disease; gonadal disorders and infertility; neuroendocrine conditions; benign and malignant glandular tumours; disorders of growth; genetic and congenital glandular dysfunction; lipid and nutritional abnormalities; menopausal disorders; and osteoporosis and metabolic bone disease.

Endocrine conditions are diverse in their requirement for specialist medical care. Many pose a diagnostic challenge, and in some the choice of therapy requires fine judgement. Endocrine disorders affect many body systems, and call for expertise in metabolic disease, clinical biochemistry, cardiovascular disease, neurology, renal medicine, genetics and psychology of chronic disease. Moreover, their impact is often lifelong, requiring a strong therapeutic partnership between the endocrinologist and patient.

Endocrinologists need to be able to interpret biochemical tests relating to endocrine diagnosis and have a good understanding of the laboratory methods underlying these analyses and their limitations. Consequently experience in clinical or laboratory research and in diagnostic endocrine laboratory medicine is a strongly recommended component of training. Endocrinologists need to be familiar with relevant organ imaging investigations, including nuclear medicine. Procedural skills include hormone implants and fine needle aspiration as they relate to endocrine diagnosis.

During their training, endocrinologists acquire a depth and breadth of knowledge in clinical endocrinology and metabolism. In addition they develop a detailed understanding of the principles of endocrine physiology, biochemistry, and cellular and hormonal metabolism that underlie clinical specialist practice. They also develop expertise with diagnostic laboratory endocrinology and with imaging of endocrine organs. They become conversant with the current literature in both basic and applied endocrinology and gain an understanding of research activities in the endocrine field. Most will also have an opportunity to contribute to endocrine research.

CURRICULUM OVERVIEW

Endocrinology – Advanced Training Curriculum

This curriculum outlines the broad concepts, related learning objectives, underlying theoretical knowledge, clinical skills, and approaches to clinical problems required and commonly used by endocrinology physicians within Australia and New Zealand.

The purpose of Advanced Training is for trainees to build on the cognitive and practical skills acquired during Basic Training. At the completion of the Endocrinology Advanced Training Program, trainees should be competent to provide at consultant level, unsupervised comprehensive medical care in endocrinology.

Attaining competency in all aspects of this curriculum is expected to take three years of training. It is expected that all teaching, learning and assessment associated with the Endocrinology Advanced Training Curriculum will be undertaken within the context of the physician's everyday clinical practice and will accommodate discipline-specific contexts and practices as required. It will need to be implemented within the realities of current workplace and workforce issues and the needs of health service provision. In particular, it will be appreciated that many endocrine disorders are individually rare (although collectively common), and the trainee will not have the opportunity to see first-hand the full range of endocrine conditions during Advanced Training. Nevertheless, familiarity with these disorders is still considered essential since the endocrinologist will be the first line of referral and at least initial management.

There may be learning objectives that overlap with or could easily relate to other domains; however, to avoid repetition, these have been assigned to only one area. In practise, it is anticipated that within the teaching/learning environment, the progression of each objective would be explored.
Note: The curricula should always be read in conjunction with the relevant College Training Handbook available on the College website.

Professional Qualities Curriculum

The Professional Qualities Curriculum (PQC) outlines the range of concepts and specific learning objectives required by, and utilised by, all physicians, regardless of their specialty or area of expertise. It spans both the Basic and Advanced Training Programs and is also utilised as a key component of the Continuing Professional Development (CPD) program.

Together with the various Basic and Advanced Training curricula, the PQC integrates and fully encompasses the diagnostic, clinical, and educative-based aspects of the physician's/paediatrician's daily practice.

Each of the concepts and objectives within the PQC will be taught, learnt and assessed within the context of everyday clinical practice. It is important, therefore, that they be aligned with, and fully integrated into, the learning objectives within this curriculum.

EXPECTED OUTCOMES AT THE COMPLETION OF TRAINING

At the completion of the Advanced Training Program in Endocrinology, as defined by this curriculum, it is expected that a new Fellow will have developed the clinical skills and have acquired the theoretical knowledge for competent endocrinology practice within the current and emerging professional, medical and societal contexts. It is expected that a new Fellow will:

- contribute to the education of colleagues, students, junior medical officers, and other health care workers
- have the skills required to acquire and process new knowledge
- promote and maintain excellence both personally and in their workplace, through actively supporting or participating quality assurance activities
- appreciate the relevance of basic and clinical research, and have had some experience personally of research during their training period.

CURRICULUM THEMES AND LEARNING OBJECTIVES

Each of the curriculum documents has been developed using a common format, thereby ensuring a degree of consistency and approach across the spectrum of training.

Domains

The domains are the broad fields which group common or related areas of learning.

Themes

The themes identify and link more specific aspects of learning into logical or related groups.

Learning Objectives

The learning objectives outline the specific requirements of learning. They provide a focus for identifying and detailing the required knowledge, skills and attitudes. They also provide a context for specifying assessment standards and criteria as well as providing a context for identifying a range of teaching and learning strategies.

LEARNING OBJECTIVES TABLES

DOMAIN 1	GENERIC PRINCIPLES OF ENDOCRINOLOGY
Theme 1.1	Classes of Hormones
Learning Objectives	
1.1.1	Describe structure and function of hormones
Theme 1.2	Mechanisms of Hormone Action
Learning Objectives	
1.2.1	Outline mechanisms of hormone action
Theme 1.3	Regulation of Hormonal Systems
Learning Objectives	
1.3.1	Describe regulation of hormonal systems

DOMAIN 2	DIABETES MELLITUS
Theme 2.1	Diagnose and Manage Diabetes Mellitus
Learning Objectives	
2.1.1	Identify the normal and abnormal anatomy and physiology of the pancreatic beta cell, of insulin-responsive tissues and of counter-regulatory hormones
2.1.2	Diagnose and manage patients with, or at increased risk of, diabetes mellitus
Theme 2.2	Diabetic Emergencies
Learning Objectives	
2.2.1	Manage hyperglycaemic metabolic emergencies and severe hypoglycaemia
Theme 2.3	Diabetes During Acute Illness or Surgery
Learning Objectives	
2.3.1	Manage patients with diabetes mellitus during acute illness or surgery
Theme 2.4	Conception and Pregnancy in Diabetes Mellitus
Learning Objectives	
2.4.1	Manage preconception, conception and pregnancy in women with diabetes (types 1, 2 and gestational diabetes)
Theme 2.5	Age-Related Conditions and Diabetes Mellitus
Learning Objectives	
2.5.1	Provide care to young people with diabetes mellitus in transition to adult services
2.5.2	Provide care to older people with diabetes mellitus
Theme 2.6	Complications of Diabetes Mellitus
Learning Objectives	
2.6.1	Outline principles and practice of screening for diabetic complications
2.6.2	Assess, diagnose, manage and prevent macrovascular disease in patients with diabetes, including ischaemic heart disease, cerebrovascular disease and peripheral vascular disease
2.6.3	Assess, diagnose, manage and prevent diabetic eye disease
2.6.4	Assess, diagnose, manage and prevent renal disease and hypertension in patients with diabetes mellitus
2.6.5	Assess, diagnose, manage and prevent diabetic neuropathy
2.6.6	Assess, diagnose and manage other complications associated with diabetes

2.6.7	Assess and manage psychological issues associated with diabetes
DOMAIN 3	**ENDOCRINE SYSTEMS AND DISORDERS**
Theme 3.1	Pituitary and Hypothalamus
Learning Objectives	
3.1.1	Identify normal and abnormal anatomy and physiology of the hypothalamus and pituitary gland, including biochemical and radiological assessment
3.1.2	Diagnose, manage and provide care for patients with disorders of the hypothalamus and/or the pituitary gland
3.1.3	Assess, diagnose and manage prolactinoma
3.1.4	Assess, diagnose and manage acromegaly
3.1.5	Assess, diagnose and manage Cushing's disease
3.1.6	Assess, diagnose and manage TSH-secreting pituitary adenoma (TSHoma) and non-silent gonadotropinoma
3.1.7	Assess, diagnose and manage non-functioning pituitary tumours
3.1.8	Assess, diagnose and manage congenital and acquired hypopituitarism
3.1.9	Assess, diagnose and manage central diabetes insipidus
3.1.10	Assess, diagnose and manage pituitary disorders in pregnancy
3.1.11	Assess, diagnose and manage inherited pituitary disorders
3.1.12	Assess, diagnose and manage craniopharyngiomas and perisellar cysts, including Rathke's cleft cysts
3.1.13	Assess, diagnose and manage parasellar masses and pineal gland tumours
Theme 3.2	Growth and Development
Learning Objectives	
3.2.1	Outline principles of disorders of growth
3.2.2	Outline principles of management of short and tall stature
Theme 3.3	Thyroid
Learning Objectives	
3.3.1	Identify normal and abnormal anatomy and physiology of the thyroid gland and hypothalamic-pituitary-thyroid axis
3.3.2	Diagnose, manage and provide care for patients with thyroid disease
3.3.3	Assess, diagnose and manage hyperthyroidism

3.3.4	Assess, diagnose and manage hypothyroidism
3.3.5	Assess, diagnose and manage thyroid disorders in pregnancy
3.3.6	Assess, diagnose and manage Graves' ophthalmopathy
3.3.7	Assess, diagnose and manage nodular thyroid disease
3.3.8	Assess, diagnose and manage thyroid cancer
3.3.9	Assess, diagnose and manage inherited thyroid disorders
Theme 3.4	Adrenal
Learning Objectives	
3.4.1	Identify normal and abnormal anatomy and physiology of the adrenal gland and hypothalamic-pituitary-adrenal axis
3.4.2	Diagnose, manage and provide care for patients with adrenal disease
3.4.3	Assess, diagnose and manage Addison's disease/hypoadrenalism
3.4.4	Assess, diagnose and manage Cushing's syndrome due to adrenal neoplasm
3.4.5	Assess and manage long-term administration of glucocorticoids and complications
3.4.6	Assess, diagnose and manage catecholamine excess (phaeochromocytoma and paraganglioma)
3.4.7	Assess, diagnose and manage mineralocortocoid excess
3.4.8	Assess, diagnose and manage adrenal nodules/incidentalomas
3.4.9	Assess, diagnose and manage adrenal cancer
3.4.10	Assess, diagnose and manage inherited adrenal disorders
Theme 3.5	Reproductive Endocrinology
Learning Objectives	
3.5.1	Identify normal and abnormal anatomy and physiology of the ovary and testes and hypothalamic-pituitary-gonadal axis
3.5.2	Diagnose, manage and provide care for patients with gonadal disorders
3.5.3	Assess, diagnose and manage female patients with hyperandrogenism
3.5.4	Assess, diagnose and manage polycystic ovarian syndrome
3.5.5	Assess, diagnose and manage functioning ovarian tumours
3.5.6	Assess, diagnose and manage menopause
3.5.7	Assess, diagnose and manage male hypogonadism
3.5.8	Assess, diagnose and manage oligo/azoospermia

3.5.9	Assess, diagnose and manage gynaecomastia
3.5.10	Assess, diagnose and manage functioning testicular tumours
3.5.11	Assess, diagnose and manage congenital gonadal disorders
3.5.12	Develop a diagnostic approach and management plan for patients presenting with infertility
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objectives	
3.6.1	Identify the normal and abnormal anatomy and physiology of the parathyroid glands
3.6.2	Describe normal and abnormal calcium, phosphate, magnesium and skeletal homeostasis
3.6.3	Diagnose, manage and provide care for patients with hyperparathyroidism (primary, secondary and tertiary)
3.6.4	Assess, diagnose and manage parathyroid hormone (PTH)-independent hypercalcaemia
3.6.5	Assess, diagnose and manage hypocalcaemia
3.6.6	Assess, diagnose and manage osteoporosis
3.6.7	Assess, diagnose and manage osteomalacia or rickets
3.6.8	Assess, diagnose and manage hypophosphataemia
3.6.9	Assess, diagnose and manage Paget's disease of bone and other sclerosing bone disorders
3.6.10	Assess, diagnose and manage renal calculi due to endocrine disease
3.6.11	Assess, diagnose and manage the adult with inherited disorders of the skeleton (skeletal dysplasias such as osteogenesis imperfecta, hyperostosis, fibrous dysplasias)
Theme 3.7	Disorders of Appetite and Weight
Learning Objectives	
3.7.1	Assess, diagnose, and manage patients with disorders of appetite and weight
Theme 3.8	Neuroendocrine Tumours
Learning Objectives	
3.8.1	Identify the normal and abnormal anatomy and physiology of the neuroendocrine system
3.8.2	Assess, diagnose and manage patients with neuroendocrine tumours
Theme 3.9	Lipid Disease
Learning Objectives	
3.9.1	Assess, diagnose and manage disorders of lipid metabolism

Theme 3.10	Integrative Endocrinology
Learning Objectives	
3.10.1	Assess, diagnose and mange non-iatrogenic hypoglycaemia
3.10.2	Assess, diagnose and manage syndrome of inappropriate antidiuretic hormone secretion (SIADH)
3.10.3	Assess, diagnose and manage humoral complications of cancer
3.10.4	Assess, diagnose and manage endocrine late effects of cancer
3.10.5	Assess, diagnose and manage multiple endocrine neoplasia (MEN) syndromes
3.10.6	Assess, diagnose and manage autoimmune polyendocrinopathy syndromes
3.10.7	Assess, diagnose and manage endocrine disorders secondary to infectious disease, including HIV
3.10.8	Assess, diagnose and manage endocrine manifestations of haemochromatosis
DOMAIN 4	**APPROACHES TO COMMON PRESENTING PROBLEMS**
Theme 4.1	Approaches to Common Presenting Problems
Learning Objectives	
4.1.1	Develop a diagnostic approach and management plan for polydipsia and polyuria
4.1.2	Develop a diagnostic approach and management plan for weight gain
4.1.3	Develop a diagnostic approach and management plan for weight loss
4.1.4	Develop a diagnostic approach and management plan for erectile dysfunction/loss of libido
4.1.5	Develop a diagnostic approach and management plan for menstrual disturbance
4.1.6	Develop a diagnostic approach and management plan for bone pain and/or fracture
4.1.7	Develop a diagnostic approach and management plan for hirsutism
4.1.8	Develop a diagnostic approach and management plan for anterior neck lumps
4.1.9	Develop a diagnostic approach and management plan for hypertension
4.1.10	Develop a diagnostic approach and management plan for flushing and/or sweating
4.1.11	Develop a diagnostic approach and management plan for fatigue
4.1.12	Develop a diagnostic approach and management plan for galactorrhoea

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.1	Laboratory Investigations
Learning Objectives	
5.1.1	Order and interpret relevant laboratory investigations for patients with endocrine disease, including endocrine hormone assays and dynamic endocrine testing
Theme 5.2	Radiology
Learning Objectives	
5.2.1	Order and interpret radiological investigations
5.2.2	Order and interpret ultrasound investigations
Theme 5.3	Nuclear Medicine
Learning Objectives	
5.3.1	Order and interpret nuclear medical imaging in endocrine disease
Theme 5.4	Measurement of bone density and structure
Learning Objectives	
5.4.1	Order and interpret bone densitometry investigations
5.4.2	Order and interpret quantitative bone ultrasound and quantitative CT assessment of bone density
Theme 5.5	Research Methods
Learning Objectives	
5.5.1	Outline and apply research methods
DOMAIN 6	**PROFESSIONAL QUALITIES SPECIFIC TO ENDOCRINOLOGY**
Theme 6.1	Professional Qualities of the Endocrinologist
Learning Objectives	
6.1.1	Access, assess and apply guidelines and consensus statements for clinical practice with respect to endocrine disorders
6.1.2	Counsel and educate endocrine patients and their families on management of endocrine disorders
6.1.3	Advocate for endocrine patients

DOMAIN 1	GENERIC PRINCIPLES OF ENDOCRINOLOGY
Theme 1.1	Classes of Hormones
Learning Objective 1.1.1	Describe structure and function of hormones
Knowledge	

- describe synthesis, (linear) structure and function of peptide hormones
- describe synthesis, structure and function of steroid and thyroid hormones
- describe synthesis, structure and function of aminergic hormones.

DOMAIN 1	GENERIC PRINCIPLES OF ENDOCRINOLOGY
Theme 1.2	Mechanisms of Hormone Action
Learning Objective 1.2.1	Outline mechanisms of hormone action
Knowledge	

- describe classes of peptide and aminergic hormone receptors
- describe principles of G-protein coupled receptor signalling
- describe principles of tyrosine kinase receptor signalling
- describe principles of serine kinase receptor signalling
- describe principles of cytokine receptor signalling
- describe classes of nuclear hormone receptors
- describe principles of nuclear receptor signalling
- distinguish between endocrine, paracrine and autocrine functions of hormones.

DOMAIN 1	GENERIC PRINCIPLES OF ENDOCRINOLOGY
Theme 1.3	Regulation of Hormonal Systems
Learning Objective 1.3.1	Describe regulation of hormonal systems
Knowledge	

- describe major stimuli for, and inhibitors of, secretion of major individual hormones, including:
  - corticotropin-releasing hormone (CRH)
  - thyrotropin-releasing hormone (TRH)
  - gonadotropin-releasing hormone (GnRH)
  - growth-hormone-releasing hormone (GHRH)
  - somatostatin
  - dopamine
  - adrenocorticotropic hormone (ACTH)
  - thyroid-stimulating hormone (TSH)
  - luteinising hormone (LH)

DOMAIN 1	GENERIC PRINCIPLES OF ENDOCRINOLOGY
Theme 1.3	Regulation of Hormonal Systems
Learning Objective 1.3.1	Describe regulation of hormonal systems

- follicle-stimulating hormone (FSH)
- growth hormone (GH)
- prolactin
- arginine vasopressin (AVP)/antidiuretic hormone (ADH)
- oxytocin
- thyroid hormones
- cortisol
- aldosterone
- adrenal androgens
- estrogen
- progesterone
- testosterone
- inhibins and activins
- insulin
- glucagon
- glucagon-like peptide (GLP)/gastric inhibitory polypeptides (GIPs)
- leptin
- serotonin
- catecholamines
- calcitonin
- parathyroid hormone (PTH)
- vitamin D
- parathyroid hormone-related protein (PTHrP)
- fibroblast growth factor 23 (FGF23)

- describe negative and positive feedback regulation of endocrine systems.

DOMAIN 2	DIABETES MELLITUS
Theme 2.1	Diagnose and Manage Diabetes Mellitus
Learning Objective 2.1.1	Identify the normal and abnormal anatomy and physiology of the pancreatic beta cell, of insulin-responsive tissues, and of counter-regulatory hormones

Knowledge

- identify normal and abnormal anatomy and physiology of pancreatic beta cell
- identify insulin-responsive tissues
- identify counter-regulatory hormones to insulin action.

DOMAIN 2	DIABETES MELLITUS
Theme 2.1	Diagnose and Manage Diabetes Mellitus
Learning Objective 2.1.2	Diagnose and manage patients with, or at increased risk of, diabetes mellitus

Knowledge	Skills
• define diagnostic criteria of diabetes mellitus (DM) • define diagnostic criteria for pre-diabetes and identify the different types • describe properties, principles and indications for glucose measurement • describe normal and abnormal physiology of glucose homeostasis • outline the underlying basis of metabolic disturbances and principles of management • describe monitoring of glycaemic control in DM • explain classification and pathogenesis of DM, including secondary causes of diabetes • explain pharmacological therapy of type 1 DM • explain pharmacological therapy of type 2 DM • explain pharmacological therapy of other types of DM • define principles of nutrition management of DM • define principles of other lifestyle management of DM • describe characteristics of oral hypoglycaemic drugs available and identify appropriate use • describe characteristics of insulins available and define their use in intensive insulin management • define the effects of other concurrent drug therapies on glycaemia and their interactions with diabetes therapies • describe the principles of continuous subcutaneous insulin infusion (CSII, 'insulin pump') therapy • outline systems used to monitor blood glucose, including continuous glucose monitoring systems • define principles of education (both individual and group) in patients with DM • discuss cultural and educational barriers to glucose control • describe requirement for assessing fitness to drive in patient with diabetes	• ellicit an appropriate history and interpret tests to differentiate different types of diabetes, including types 1 and 2, gestational, congenital, and secondary causes of diabetes • use appropriate strategies for prevention and detection of DM • prescribe appropriate preventive strategies/ treatments for micro- and macrovascular complications of diabetes • manage glycaemia in DM • establish appropriate goals for glucose, blood pressure, lipids and weight for individual patients • assess, diagnose and manage hypoglycaemia secondary to treatment of DM • contribute to and support a program or strategy designed to prevent or delay the onset of diabetes mellitus • educate patient in the use of insulin delivery devices including syringes, pens and pumps • educate patients in the use of home blood glucose monitoring systems • advise on indications for insulin therapy in type 2 diabetes • make appropriate insulin dose adjustments, applying different regimens for multiple daily intermittent injection (MDII) insulin therapy and CSII therapy • advise on dietary principles for diabetes, including carbohydrate counting • advise on dose adjustment in response to blood glucose levels, exercise, alcohol etc • identify complications of diabetes and perform screening for complications at appropriate intervals • identify patient appropriate for psychological intervention • advise patient on employment, exercise, alcohol, weight management, smoking and family planning • assess patient with diabetes for fitness to drive

DOMAIN 2	DIABETES MELLITUS
Theme 2.1	Diagnose and Manage Diabetes Mellitus
Learning Objective 2.1.2	Diagnose and manage patients with, or at increased risk of, diabetes mellitus

• describe principles, properties, indications for and limitations of beta cell transplantation, including whole pancreas or islet cell transplantation.	• identify other autoimmune conditions associated with type 1 diabetes, and perform screening for these at appropriate intervals • refer patient for pancreas or islet cell transplantation where appropriate • monitor patient with pancreas or islet cell transplant for complications of therapy, and for failure of transplant • recognise the importance of multidisciplinary input to the management of diabetes, and participate effectively in a multidisciplinary team.

DOMAIN 2	DIABETES MELLITUS
Theme 2.2	Diabetic Emergencies
Learning Objective 2.2.1	Manage hyperglycaemic metabolic emergencies and severe hypoglycaemia

Knowledge	Skills
• describe signs and symptoms of diabetic hyperglycaemic metabolic emergency • characterise different types of diabetic hyperglycaemic metabolic emergency • outline the underlying basis of metabolic disturbances and principles of management • describe signs and symptoms of diabetic hypoglycaemia • recognise the impact of hypoglycaemia unawareness on the lifestyle of patients, their families and carers.	• recognise and judge the urgency and severity of the emergency • identify and differentiate between different hyperglycaemic emergencies • assess, diagnose and manage diabetic ketoacidosis • assess, diagnose and manage diabetic hyperosmolar non-ketotic state • assess, diagnose and manage severe hypoglycaemia and provide advice about future prevention • identify factors that may have contributed to hyper- or hypoglycaemic emergencies • identify patient with hypoglycaemia unawareness and provide them advice on management of the condition • formulate appropriate plan for investigation and management, including identifying appropriate patients for escalation of treatment to critical care • communicate with other health care professionals and convey management plans • give advice about future prevention of hyper- and hypoglycaemic emergencies.

DOMAIN 2	DIABETES MELLITUS
Theme 2.3	Diabetes During Acute Illness or Surgery
Learning Objective 2.3.1	Manage patients with diabetes mellitus during acute illness or surgery

Knowledge	Skills
• describe the impact of acute illness on glycaemia and its effects/implications on management • describe the impact of other treatments such as glucocorticoids/parenteral nutrition on glycaemia • define metabolic requirements of patient with diabetes during surgery • describe implications of glucose control during other illnesses such as cardio- and cerebrovascular illnesses.	• adjust therapy in the short term to manage glucose control during acute illness • manage diabetes in patient on glucocorticoids or parenteral nutrition • manage diabetes in perioperative patient • supervise and advise other health care professionals in the management of patient with diabetes under their care.

DOMAIN 2	DIABETES MELLITUS
Theme 2.4	Conception and Pregnancy in Diabetes Mellitus
Learning Objective 2.4.1	Manage preconception, conception and pregnancy in women with diabetes (types 1, 2 and gestational diabetes)

Knowledge	Skills
• discuss importance of glucose control in preconception and during pregnancy • describe effect of diabetes on pregnant women and fetus, and strategies for their amelioration • describe effect of pregnancy on diabetes management and glycaemia • describe effect of pregnancy on diabetes complications, in particular retinopathy • list risk factors for gestational diabetes and current diagnostic criteria and appropriate screening strategies • explain pharmacological therapy of gestational diabetes mellitus • describe methods of contraception.	• discuss the importance of diabetes in pregnancy and the need for family planning in fertile women of all ages • advise women about the importance of preconception care and potential risks of diabetic pregnancy, including progression of complications • advise women with diabetes regarding contraception • optimise glycaemic and blood pressure control prior to and throughout pregnancy • refer for retinopathy screening during pregnancy where appropriate • diagnose and manage gestational diabetes • deliver antenatal care • manage glycaemia during labour and delivery • manage intercurrent illness and events, such as administration of glucocorticoids in order to mature fetal lungs • communicate and work with obstetricians and midwives in the joint management of diabetes in pregnancy.

DOMAIN 2	DIABETES MELLITUS
Theme 2.5	Age-Related Conditions and Diabetes Mellitus
Learning Objective 2.5.1	Provide care to young people with diabetes mellitus in transition to adult services

Knowledge	Skills
• describe effects of diabetes on normal growth and development in children • describe physiological, psychological and social factors affecting glycaemic control in adolescence • recognise ways in which a practitioner's behaviour can impact on young people • recognise the rights of children and young people.	• provide care to young people with diabetes in transition to adult services • recognise common risk taking behaviour in young people and its effects on diabetes • recognise potentially negative effects of adolescent behaviour on diabetes and the impact it may have on family and personal relationships • respond to physiological, psychological and social problems of maintaining glycaemic control in adolescence and the concerns and anxieties of parents/carers.

DOMAIN 2	DIABETES MELLITUS
Theme 2.5	Age-Related Conditions and Diabetes Mellitus
Learning Objective 2.5.2	Provide care to older people with diabetes mellitus

Knowledge	Skills
• describe potential effects of comorbidities associated with ageing on diabetes treatments and control • describe effects of aging, including associated disability on access to healthcare • identify agencies and healthcare workers that can support older people living in the community.	• adapt therapeutic targets and diabetes treatment regimens to the individual patient taking account of comorbidities • manage specific social and medical needs of older people with diabetes • advise about the care of older people in residential and nursing care, taking into account appropriate utilisation of health service resources • adjust management and therapeutic targets as required.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.1	Outline principles and practice of screening for diabetic complications

Knowledge	Skills
• describe principles and practice of screening • list criteria for urgent referral to appropriate services when diabetic complications are identified.	• implement a screening program for diabetic complications.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.2	Assess, diagnose, manage and prevent macrovascular disease in patients with diabetes, including ischaemic heart disease, cerebrovascular disease and peripheral vascular disease

Knowledge	Skills
• discuss importance of hyperglycaemia as a risk factor for macroangiopathy • describe other risk factors for macroangiopathy, including elements of the metabolic syndrome • describe presenting features of cerebrovascular, cardiovascular and peripheral vascular disease • describe treatments for non glycaemic risk factors for macroangiopathy.	• identify and manage glycaemia and other modifiable risk factors for macroangiopathy • diagnose and manage heart failure in diabetes • investigate and manage diabetic patient with established macrovascular disease • manage diabetic patient suffering acute myocardial infarction and stroke • recognise when to refer patient for specialist investigation and treatment, e.g. cardiology, vascular surgery.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.3	Assess, diagnose, manage and prevent diabetic eye disease

Knowledge	Skills
• describe how diabetes can affect the eye • describe pathogenesis and different stages of diabetic retinopathy • discuss the importance of glycaemic control, lipid and blood pressure management in diabetic eye disease • outline the importance of visual acuity testing and retinal screening • list treatments for eye complications • describe implications of eye complications on driving and employment • describe the structure of a retinal screening program.	• diagnose cataract, and all grades of severity of retinopathy and maculopathy, using direct ophthalmoscopy • interpret retinal photographs • identify other ocular disorders associated with diabetes • perform and interpret visual acuity testing • recognise diabetic eye complications that need urgent ophthalmology referral • refer appropriate patient for specialist ophthalmic assessment • communicate to patient and advise accordingly about the treatments available for eye complications and the implications of eye complications on driving and employment • assess the impact of diabetic eye complications on patients.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.4	Assess, diagnose, manage and prevent renal disease and hypertension in patients with diabetes mellitus

Knowledge	Skills
• describe how diabetes can affect different parts of the kidney • describe pathogenesis and stages of diabetic nephropathy • describe the effect of hypertension on diabetic nephropathy • describe significance of proteinuria in the increased incidence of macroangiopathy • describe treatment thresholds of blood pressure in patients with diabetes and nephropathy • describe tests for diagnosing nephropathy and explain the importance of screening for early nephropathy • describe treatments for diabetic nephropathy and explain the importance of screening for early nephropathy • describe treatments for diabetic nephropathy and hypertension • describe implications of a diagnosis of diabetic nephropathy on patient, their carers and families.	• manage hypertension • manage glycaemia in patient with renal impairment • diagnose nephropathy and distinguish between its different stages (early/late) • evaluate other macrovascular risk factors in patient with diabetic nephropathy • advise/counsel patient about the significance of nephropathy • communicate to patient the importance of blood pressure and glycaemic management in the prevention and slowing of progression of nephropathy • communicate to patient the importance of blood pressure and glycaemic management in the prevention and slowing of progression of nephropathy • communicate significance of a diagnosis of nephropathy to patient • communicate with colleagues in specialist nephrology services and refer patient appropriately.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.5	Assess, diagnose, manage and prevent diabetic neuropathy

Knowledge	Skills
• describe how diabetes can affect different parts of the nervous system • describe pathogenesis and different manifestations of diabetic neuropathy • describe pathogenesis and manifestations of diabetic gastroparesis • describe diabetic Charcot arthropathy • describe risks of antibiotic therapy and importance of prescribing policies • outline principles of infection control • describe the impact of amputation on patients and their carers and the importance of effective rehabilitation.	• diagnose different patterns of autonomic and somatic poly- and mononeuropathies • manage neuropathies, including neurogenic pain and manifestations of autonomic neuropathy • assess and manage erectile dysfunction in diabetic men • assess and manage patient with diabetic gastroparesis • assess and manage patient with postural hypotension • assess vascular supply and neurological status of the lower limb • identify patient at risk of foot problems and advise on prevention • manage established diabetic foot problems, including use of appropriate antibiotic treatment • counsel patient on matters of infection risk, transmission and control • identify and manage Charcot arthropathy • recognise when to refer patient for specialist foot care • manage established diabetic foot problems • communicate advice on prevention of foot ulceration.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.6	Assess, diagnose and manage other complications associated with diabetes

Knowledge	Skills
• define and describe the pathogenesis of skin and rheumatological complications associated with diabetes, including dermopathy, necrobiosis and cheiroarthropathy • outline principles of infection control • describe risks of antibiotic and importance of prescribing policies.	• assess, diagnose and manage skin and rheumatological complications of diabetes • counsel patients on infection risk, transmission and control • actively engage in local infection control procedures • prescribe antibiotics according to local antibiotic guidelines and liaise appropriately with microbiological services • recognise potential for cross-infection in clinical settings, and practice aseptic technique whenever relevant.

DOMAIN 2	DIABETES MELLITUS
Theme 2.6	Complications of Diabetes Mellitus
Learning Objective 2.6.7	Assess and manage psychological issues associated with diabetes

Knowledge	Skills
• describe short- and long-term psychological issues associated with living with chronic disease.	• manage and/or refer patient with psychological difficulties associated with diabetes.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.1	Identify normal and abnormal anatomy and physiology of the hypothalamus and pituitary gland, including biochemical and radiological assessment

Knowledge
• identify normal and abnormal embryology, anatomy and physiology of the hypothalamus and pituitary gland.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.2	Diagnose, manage and provide care for patients with disorders of the hypothalamus and/or the pituitary gland

Knowledge	Skills
• describe the functions of the hypothalamus • describe properties, principles and indications for biochemical investigation of hypothalamo-pituitary disease, including dynamic testing • describe principles of and indications for imaging of the hypothalamus and pituitary • describe causes and treatments for disorders of the hypothalamus and pituitary • describe principles of and indications for pituitary surgery and pituitary irradiation • describe the pre-, peri- and postoperative management of patient with pituitary disease, with particular emphasis on management of endocrine disturbances • describe the genetics of Prader-Willi syndrome	• assess, diagnose and manage patients with hypothalamic disease, including derangements of appetite, thirst, thermoregulation and somnolence • perform and interpret basal and dynamic tests of pituitary function • interpret normal and abnormal pituitary imaging on MRI and CT imaging • diagnose and provide first line management of functioning and non-functioning pituitary tumours • manage patient before, during and after surgery for pituitary tumours • diagnose and manage patient with hypodipsia • assess, diagnose and manage acquired hypopituitarism

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.2	Diagnose, manage and provide care for patients with disorders of the hypothalamus and/or the pituitary gland

• describe histology of the normal pituitary gland and of pituitary tumours • describe the natural history of pituitary tumour types.	• assess, diagnose and manage inherited pituitary disorders.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.3	Assess, diagnose and manage prolactinoma

Knowledge	Skills
• describe properties of serum prolactin assays • describe causes of hyperprolactinaemia • describe indication for pituitary imaging in hyperprolactinaemia • differentiate between hyperprolactinaemia from functioning pituitary tumour vs. 'stalk effect' • describe role of dopamine in negative regulation of lactotrope • describe the mechanism of differing dopamine agonists, particularly with respect to side effects.	• assess, diagnose and manage patient with hyperprolactinaemia • manage prolactinoma with medical treatments • identify and refer patient with prolactinoma requiring operative management and/or radiotherapy where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.4	Assess, diagnose and manage acromegaly

Knowledge	Skills
• describe properties of serum growth hormone and insulin-like growth factor (IGF)-1 assays • describe causes of elevated IGF-1 • describe indication for pituitary imaging in acromegaly • differentiate between excess growth hormone secretion from functioning pituitary tumour and that secondary to excess growth hormone releasing hormone • describe role of somatostatin in negative regulation of somatotrope • describe somatostatin receptor subclasses, and relevance to therapeutics • describe therapeutic options, medical, surgical, radiotherapy, for patient with acromegaly, and discuss treatment pathway options.	• assess patient with acromegaly • perform and interpret glucose suppression test for diagnosis of acromegaly • manage acromegaly with medical treatments, including somatostatin analogues • recognise and manage the medical complications of acromegaly • identify and refer patient with acromegaly who requires neurosurgery and/or radiotherapy • provide acute and chronic management of patient with acromegaly both before and after pituitary surgery and/or radiotherapy.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.5	Assess, diagnose and manage Cushing's disease

Knowledge	Skills
• describe normal hypothalamic-pituitary-adrenal physiology, including cortisol binding globulin • describe properties of serum, urine and salivary cortisol assays, and serum ACTH assay • describe causes of elevated serum, urine and salivary cortisol • describe principles of dexamethasone suppression tests for investigation of Cushing's syndrome • describe indication for organ imaging in Cushing's syndrome • describe principles of petrosal sinus sampling for investigation of Cushing's disease • describe investigations for ectopic ACTH secretion • describe pseudo-Cushing's syndrome • describe cyclical Cushing's syndrome.	• assess patient with Cushing's syndrome • perform and interpret diagnostic biochemical tests of cortisol excess, with particular emphasis on the sensitivity and specificity in diagnosis of Cushing's syndrome • diagnose Cushing's disease, pituitary ACTH-dependent Cushing's syndrome • manage Cushing's disease with medical treatments • recognise and manage the medical complications of Cushing's syndrome • identify and refer patient with Cushing's disease who requires neurosurgery and/or radiotherapy • provide acute and chronic management of patients with Cushing's disease both before and after pituitary surgery and/or radiotherapy • assess, diagnose and manage patient with pseudo-Cushing's syndrome • assess, diagnose and manage patient with cyclical Cushing's syndrome.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.6	Assess, diagnose and manage TSH-secreting pituitary adenoma (TSHoma) and non-silent gonadotropinoma

Knowledge	Skills
• describe normal thyroid hormone axis • describe normal gonadal hormone axis • describe 'sick euthyroid' syndrome • describe properties of serum TSH and free thyroid hormone assays • describe differential diagnosis of elevated free thyroid hormone levels and non-suppressed serum TSH • describe properties of serum FSH and LH, estradiol and progesterone, testosterone and inhibin assays.	• assess patient with TSHoma or non-silent gonadotropinoma • manage TSHoma or non-silent gonadotropinoma with medical treatments • identify and refer patient with TSHoma or non-silent gonadotropinoma who requires neurosurgery and/or radiotherapy • provide acute and chronic management of patients with TSHoma both before and after pituitary surgery and/or radiotherapy.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.7	Assess, diagnose and manage non-functioning pituitary tumours

Knowledge	Skills
• describe pituitary function testing required to diagnose a pituitary tumour as non-functioning • describe differential diagnosis of non-functioning pituitary neoplasm • describe the natural history of pituitary 'incidentalomas' and the appropriate monitoring of patient • describe the natural history of pituitary malignancies.	• assess patient with non-functioning pituitary tumour • manage non-functioning pituitary tumour with medical treatments • identify and refer patient with non-functioning pituitary tumour who requires neurosurgery and/or radiotherapy • provide acute and chronic management of patient with non-functioning pituitary tumour both before and after pituitary surgery and/or radiotherapy • recognise pituitary metastasis as possible cause of pituitary neoplasm, and manage and refer appropriately • diagnose and manage pituitary cancer, including pituitary lymphoma.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.8	Assess, diagnose and manage congenital and acquired hypopituitarism

Knowledge	Skills
• describe normal genetic control of pituitary development • describe congenital causes of hypopituitarism, e.g. Kallman's syndrome, septo-optic dysplasia • describe the genetics of Kallman's syndrome • describe causes of acquired hypopituitarism • describe lymphocytic hypophysitis • describe pituitary apoplexy, its presentation and predisposing factors • describe clinical features associated with deficiencies of growth hormone, gonadotropins, ACTH, TSH, prolactin and ADH, either in isolation or in multiple pituitary hormone deficiency • describe endocrine assessment for hypopituitarism, including basal and dynamic hormone tests and imaging tests • describe the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives for hypopituitarism, including replacement of glucocorticoids, thyroxine, gonadal steroids, gonadotropins, growth hormone and DDAVP.	• assess patient with hypopituitarism • assess patient with hypogonadotrophic hypogonadism • perform and interpret basal and dynamic pituitary function tests • order and interpret pituitary imaging to investigate hypopituitarism • prescribe hormone replacement for patients with hypopituitarism, with particular awareness of sick day rules for patients with ACTH deficiency • monitor efficacy and outcomes of treatment in individuals with hypopituitarism • recognise acute hypopituitarism as a medical emergency and institute glucocorticoid replacement appropriately • recognise pituitary apoplexy • identify and refer patient with hypopituitarism due to pituitary mass lesion, neoplasm, hypophysitis, apoplexy, who requires neurosurgery and/or radiotherapy • recognise and manage associated autoimmune disorders that may accompany hypophysitis.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.9	Assess, diagnose and manage central diabetes insipidus

Knowledge	Skills
• describe causes of central diabetes insipidus • describe clinical features associated with central diabetes insipidus • differentiate between central and nephrogenic diabetes insipidus, and psychogenic polydipsia • describe endocrine assessment for central diabetes insipidus, including water deprivation testing • describe the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives for central diabetes insipidus, including intravenous, intranasal and oral DDAVP • describe use of fluid balance charts and their limitations in management of patient with diabetes insipidus.	• assess and diagnose patient with diabetes insipidus • interpret biochemistry in a patient with diabetes insipidus • perform and interpret water deprivation test • order and interpret pituitary imaging to investigate central diabetes insipidus • monitor efficacy and outcomes of treatment in central diabetes insipidus • identify rarer causes of central diabetes insipidus, including pituitary metastasis, sarcoidosis, histiocytosis X, and congenital ADH deficiency.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.10	Assess, diagnose and manage pituitary disorders in pregnancy

Knowledge	Skills
• discuss influence of pregnancy on tests of pituitary function and their interpretation • describe implications of pregnancy for management of pituitary disease.	• interpret abnormal pituitary function tests in pregnant women • assess, diagnose and manage pituitary dysfunction in pregnancy and postpartum period • identify and refer patient with pituitary disease in pregnancy and postpartum who require neurosurgery.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.11	Assess, diagnose and manage inherited pituitary disorders

Knowledge	Skills
• describe genetic causes of hypothalamic or pituitary disease • describe principles, properties, indications for and limitations of genetic tests for hypothalamic or pituitary disease.	• assess, diagnose and manage patients with inherited hyper- or hypo-pituitarism • order and interpret, after appropriate counselling, genetic tests for patient with inherited pituitary disorder • discuss referral of first degree relative of patient with inherited pituitary disorder for genetic counselling where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.12	Assess, diagnose and manage craniopharyngiomas and perisellar cysts, including Rathke's cleft cysts

Knowledge	Skills
• describe normal pituitary and hypothalamic embryological development • describe typical MRI and CT appearance of craniopharyngiomas and Rathke's cleft cysts • describe the histopathological appearance of craniopharyngiomas • describe the histopathological appearance of Rathke's cleft cysts • describe arachnoid, dermoid and epidermoid cysts • describe the natural history of craniopharyngiomas • describe the natural history of perisellar cysts.	• assess patient with craniopharyngiomas • assess patient with Rathke's cleft cysts • identify and refer patient with craniopharyngiomas who require neurosurgery and/or radiotherapy • identify and refer patient with perisellar cysts who require neurosurgery and/or radiotherapy • provide acute and chronic management of patient with craniopharyngiomas and perisellar cysts, including Rathke's cleft cysts.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.1	Pituitary and Hypothalamus
Learning Objective 3.1.13	Assess, diagnose and manage parasellar masses and pineal gland tumours

Knowledge	Skills

• describe parasellar tumours, including:
  • meningioma
  • hamatomas
  • chordomas
  • ependymomas
• describe the normal anatomy and physiology of the pineal gland
• describe intracranial germ cell tumours.
	• assess, diagnose and manage patient with parasellar tumours and lesions of the pineal gland
	• identify and refer patient with parasellar tumours and pineal lesions who require neurosurgery and/ or radiotherapy.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.2	Growth and Development
Learning Objective 3.2.1	Outline principles of disorders of growth

Knowledge	Skills
• describe different phases of human growth, i.e. fetal, childhood and adolescence • outline factors contributing to normal growth during these three phases • describe normal variations in growth patterns, including constitutional delay in growth and puberty • describe assessment of patient with growth disorders, including history, physical examination and appropriate investigations.	• use and interpret growth and growth velocity charts • use disease specific growth charts, e.g. Turner specific growth charts • perform clinical examination for assessment of growth and pubertal status.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.2	Growth and Development
Learning Objective 3.2.2	Outline principles of management of short and tall stature

Knowledge	Skills
• describe genetic and acquired causes of short and tall stature • describe effect of parental height in determining genetic height potential • outline history, physical examination and investigations which may be required in assessment of short and tall stature • describe appropriate follow-up of individuals with short and tall stature • describe treatments available for management of short and tall stature, including appropriate indications for growth hormone therapy, indications for use of high dose oestrogen or testosterone therapy, including potential risks and expected outcomes • describe psychological effects of short and tall stature.	• use and interpret growth and growth velocity charts • use disease specific growth charts, e.g. Turner specific growth charts • perform clinical examination for assessment of growth and pubertal status • interpret bone age x-rays and use Bayley-Pinneau height prediction table to predict final height • calculate midparental height.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.1	Identify normal and abnormal anatomy and physiology of the thyroid gland and hypothalamic-pituitary-thyroid axis

Knowledge

- identify normal and abnormal anatomy and physiology of the thyroid gland and hypothalamic-pituitary-thyroid axis
- describe embryology and ageing of the thyroid gland
- describe the components of thyroid gland and hypothalamic-pituitary-thyroid axis, including:
  - follicular cells, C-cells, colloid, key enzymes, thyroid hormones
  - pituitary thyrotropes, TSH
  - hypothalamus, TRH
- describe immunology, pharmacology and molecular biology of components of thyroid gland and hypothalamic-pituitary-thyroid axis.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.2	Diagnose, manage and provide care for patients with thyroid disease

Knowledge	Skills
• explain disease states in terms of disorders of physiology and biochemistry of thyroid hormones and TSH • describe indications for investigation of thyroid disease • describe properties of serum TSH and free thyroid hormone assays, including assay interference by antibodies • describe properties of anti-thyroid antibody assays • describe principles of and indications for imaging of the thyroid gland • describe causes, diagnosis and management of thyroid dysfunction and goitre • describe regulations for use of radioactive iodine for benign thyroid disease.	• interpret thyroid function test results to diagnose and exclude thyroid disease and to recognise assay interferences • diagnose and manage simple non-toxic goitre and solitary thyroid nodules • perform and/or refer appropriately for fine needle aspiration cytology of the thyroid • use and/or refer for the use of radioisotopes to diagnose thyroid disorders • manage thyroid emergencies, including thyroid patients in critical care • provide perioperative care for patient undergoing thyroid surgery, particularly preoperative preparation.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.3	Assess, diagnose and manage hyperthyroidism

Knowledge	Skills
• describe causes of hyperthyroidism • describe follow-up hyperthyroidism • describe long-term therapy of hyperthyroidism, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives, including anti-thyroid drugs (carbimazole and propylthiouracil), radio-iodine therapy and surgery.	• assess, diagnose and manage patient with hyperthyroidism • interpret abnormal thyroid function tests • interpret thyroid nuclear imaging and ultrasound in patients with hyperthyroidism • monitor efficacy and outcomes of treatment in individuals with hyperthyroidism • diagnose and treat thyroid crisis • refer patient with hyperthyroidism for treatment with radioactive iodine where appropriate • refer patient with hyperthyroidism for thyroidectomy where appropriate • recognise and manage side-effects of anti-thyroid medications • recognise and manage side-effects of radioactive iodine therapy for Graves' disease • recognise and manage side-effects of thyroidectomy for Graves' disease.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.4	Assess, diagnose and manage hypothyroidism

Knowledge	Skills
• describe causes of hypothyroidism • describe follow-up of individuals with hypothyroidism • describe other autoimmune disorders that may accompany Hashimoto's thyroid disease • describe regulation of iodine homeostasis and iodine deficiency • describe therapy of hypothyroidism, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives, including thyroxine and tertroxin.	• assess, diagnose and manage hypothyroidism in patients with goitre, symptoms of hypothyroidism or abnormal thyroid function tests • interpret abnormal thyroid function tests • interpret thyroid ultrasound in patient with hypothyroidism • monitor efficacy and outcomes of treatment in patient with hypothyroidism • interpret laboratory investigation of iodine deficiency • recognise and manage associated autoimmune disorders that may accompany Hashimoto's thyroid disease.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.5	Assess, diagnose and manage thyroid disorders in pregnancy

Knowledge	Skills
• discuss influence of pregnancy on tests of thyroid function and their interpretation • describe implications of pregnancy for management of thyroid disease.	• interpret abnormal thyroid function tests in pregnant women • assess, diagnose and manage hyperthyroidism pre-conception, in pregnancy and post-partum • assess, diagnose and manage hypothyroidism pre-conception, in pregnancy and post-partum • assess and manage nodular thyroid disease in pregnancy, and refer for surgery where appropriate • monitor efficacy and outcomes of treatment in patients with hypothyroidism.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.6	Assess, diagnose and manage Graves' ophthalmopathy

Knowledge	Skills
• describe methods of diagnosis of thyroid eye disease • describe medical therapy of thyroid eye disease, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives, including oral and intravenous glucocorticoids, cyclosporin and other immunosuppressive agents • describe surgical or radiotherapy options for management of thyroid eye disease.	• assess and diagnose thyroid eye disease, including the use of exophthalmometry • order and interpret orbital imaging with MRI and CT • manage patient with thyroid eye disease using medical therapies where appropriate • identify and refer patient with thyroid eye disease for surgery or radiotherapy where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.7	Assess, diagnose and manage nodular thyroid disease

Knowledge	Skills
• describe development of thyroid nodules • describe predisposing factors to nodular thyroid disease • describe investigation of thyroid nodular disease, especially differentiation of functioning vs. non-functioning nodules and benign vs. malignant nodules • describe therapeutic options for thyroid nodular disease • describe the role of fine needle aspiration and its interpretation in nodular thyroid disease.	• assess and diagnose patient with nodular thyroid disease • interpret abnormal thyroid function tests in nodular thyroid disease • interpret thyroid nuclear imaging and ultrasound in patients with nodular thyroid disease • perform and/or refer for fine needle aspiration biopsy of thyroid nodule, including under ultrasound guidance • manage patient with thyroid nodule(s) medically where appropriate • refer patient with thyroid nodule(s) for surgery and/or radioactive iodine where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.8	Assess, diagnose and manage thyroid cancer

Knowledge	Skills
• describe types of thyroid carcinoma and their clinical presentation • outline risk factors for malignant thyroid disease, particularly radiation exposure • describe use and indication for imaging in thyroid cancer • describe the role of fine needle aspiration and its interpretation in thyroid cancer • describe surgical options for malignant thyroid disease • describe the role of post-operative radio-iodine therapy in malignant thyroid disease • describe long-term follow-up for individuals with thyroid carcinoma, including risk of recurrence, monitoring and risk of second malignancies.	• assess, diagnose and manage patient with thyroid cancer • interpret abnormal thyroid cytology reports • refer patients with thyroid cancer for thyroid surgery where appropriate • manage post-operative thyroid hormone replacement in patient with thyroid cancer • determine appropriate dose of radioactive iodine, and/or refer for ablation of post-operative remnant thyroid tissue • determine appropriate dose of radioactive iodine, and/or refer for therapy of thyroid cancer recurrence • order and interpret biochemical measurements (thyroglobulin, anti-thyroglobulin antibodies) for detection of thyroid cancer recurrence • order (where appropriate) and interpret whole body thyroid scans, CT, MRI and PET scans in patient with thyroid cancer recurrence.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.3	Thyroid
Learning Objective 3.3.9	Assess, diagnose and manage inherited thyroid disorders

Knowledge	Skills
• describe inherited causes of hypothyroidism and hyperthyroidism • describe thyroid hormone resistance and its clinical consequences • describe principles, properties, indications for and limitations of genetic tests for inherited thyroid disorders.	• assess, diagnose and manage patient with inherited thyroid disorder • order and interpret (after appropriate counselling) genetic tests for patient with inherited thyroid disorder • discuss referral of first degree relatives of patient with inherited thyroid disorder for genetic counselling where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.1	Identify normal and abnormal anatomy and physiology of the adrenal gland and hypothalamic-pituitary-adrenal axis

Knowledge

- identify normal and abnormal anatomy and physiology of adrenal gland (cortex and medulla), hypothalamic-pituitary-adrenal axis and sympathetic/parasympathetic ganglia.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.2	Diagnose, manage and provide care for patients with adrenal disease

Knowledge	Skills
• describe causes, investigations and treatments for disorders of the adrenal glands • describe properties, principles and indications for investigation of adrenal disease • describe principles of and indications for imaging of the adrenal glands • explain importance of steroid replacement during intercurrent illness • describe principles of and indications for adrenal surgery and post-operative management of endocrine disturbance • explain importance of urgent management of adrenal insufficiency.	• perform and interpret tests of adrenal function • investigate suspected endocrine hypertension and provide first line management for phaeochromocytoma and adrenocortical hypertension • diagnose and manage non classical congenital adrenal hyperplasia and provide first line management for classical CAH in adolescents and adulthood • investigate and manage patients with suspected adrenal tumours • provide perioperative care for patients with suspected or proven adrenal insufficiency • recognise complex management issues in congenital adrenal hyperplasia, especially in females and adolescents.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.3	Assess, diagnose and manage Addison's disease/hypoadrenalism

Knowledge	Skills
• describe causes of hypocortisolism • describe genetic basis of Addison's disease/ hypoadrenalism • describe presentations and biochemical features of mineralocorticoid deficiency and glucocorticoid deficiency and their possible separation in time • outline the basal and stress requirements of glucocorticoids and mineralocorticoids • describe associated disorders, such as other autoimmune disease.	• assess, diagnose and manage patient with hypocortisolism • diagnose and manage adrenal crisis • perform and interpret Synacthen test (low and standard dose) to diagnose hypoadrenalism • perform and interpret investigations to determine the cause of the hypoadrenalism • provide long-term management of patients with hypoadrenalism, including appropriate prescribing of glucocorticoids and mineralocorticoids and follow-up screening for associated disorders • manage glucocorticoid replacement during acute stress, including perioperative management • educate patient and their families about stress replacement of glucocorticoids and precautions.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.4	Assess, diagnose and manage Cushing's syndrome due to adrenal neoplasm

Knowledge	Skills
• describe presentation and diagnosis of tumours of the adrenal cortex, including Cushing's syndrome, virilising tumours, feminising tumours and aldosterone secreting tumours • describe differential diagnosis of benign and malignant adrenal Cushing's syndrome • describe ACTH-independent macronodular adrenal hyperplasia • describe therapies of Cushing's syndrome, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess, diagnose and manage patient with Cushing's syndrome • order and interpret diagnostic biochemical tests of cortisol excess • identify and refer patient with Cushing's syndrome due to adrenal neoplasm for surgery where appropriate • manage patient with functioning adrenal neoplasia both before and after adrenal surgery.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.5	Assess, diagnose and manage long-term administration of glucocorticoids and complications

Knowledge	Skills
• describe the pharmacological actions of glucocorticoids.	• prescribe glucocorticoids appropriately • assess, monitor and manage complications of glucocorticoid therapy.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.6	Assess, diagnose and manage catecholamine excess (phaeochromocytoma and paraganglioma)

Knowledge	Skills
• describe pathophysiology of tumours producing excess catecholamines • describe assays for catecholamines, including their limitations • describe complications of phaeochromocytoma/paraganglioma • describe genetics of phaeochromocytoma/paraganglioma • describe biochemical, radiological and scintigraphic investigation of phaeochromocytoma/paraganglioma • describe therapeutic options for phaeochromocytoma/paraganglioma, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with excess catecholamine production • manage excess catecholamine production with medical therapies • refer patient with phaeochromocytoma/paraganglioma for surgery and/or radionuclide ablation where appropriate • provide acute and chronic management of patient with phaeochromocytoma/paraganglioma both before and after surgery and/or radionuclide ablation • order and interpret genetic tests (after appropriate counselling) for patient with phaeochromocytoma/paraganglioma • discuss referral of family members of patient with phaeochromocytoma/paraganglioma gene abnormality for genetic counselling where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.7	Assess, diagnose and manage mineralocortocoid excess

Knowledge	Skills
• describe pathophysiology of hyperaldosteronism • describe assays for mineralocorticoids and renin, and their limitations • describe dynamic tests for hyperaldosteronism • describe complications of hyperaldosteronism • describe biochemical, radiological and scintigraphic investigation of hyperaldosteronism • describe acquired causes of hyperaldosteronism, including differentiation between unilateral and bilateral adrenal disease • describe genetic causes of hyperaldosteronism • describe therapeutic options for mineralocorticoid excess, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with hyperaldosteronism • order and interpret aldosterone suppression tests • order and interpret adrenal vein sampling • manage hyperaldosteronism with medical therapies where appropriate • refer patient with Conn's tumour for surgery where appropriate • provide acute and chronic management of patient with Conn's tumour both before and after surgery • order and interpret genetic tests (after appropriate counselling) for patient with hyperaldosteronism • discuss referral of family members of patient with hyperaldosteronism gene abnormality for genetic counseling where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.8	Assess, diagnose and manage adrenal nodules/incidentalomas

Knowledge	Skills
• describe development of adrenal nodules • describe biochemical investigation of adrenal nodules, especially differentiation of functioning vs. non-functioning nodules and benign vs. malignant nodules • describe imaging of adrenal nodules, including CT, MRI and nuclear medicine • describe therapeutic options for adrenal nodular disease • describe the role of biopsy and its interpretation in adrenal nodules.	• assess and diagnose patient with adrenal nodule(s) • interpret abnormal adrenal function results in patient with adrenal nodule(s) • interpret adrenal imaging including CT, MRI and scintigraphy • refer patient for biopsy of adrenal nodule where appropriate • manage patient with adrenal nodule(s) with medical therapies where appropriate • refer patient with adrenal nodule(s) for surgery where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.9	Assess, diagnose and manage adrenal cancer

Knowledge	Skills
• describe development of adrenal cancer • differentiate between primary and metastatic adrenal malignant disease • describe biochemical investigation of adrenal cancer, especially differentiation of functioning vs. non-functioning cancer • describe imaging of adrenal cancer, including CT, MRI and nuclear medicine • describe therapeutic options for adrenal cancer.	• assess and diagnose patient with adrenal cancer • manage patient with adrenal cancer with medical therapies where appropriate • refer patient with adrenal cancer for surgery where appropriate • refer patient with metastasis to adrenal gland to oncology service where appropriate

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.4	Adrenal
Learning Objective 3.4.10	Assess, diagnose and manage inherited adrenal disorders

Knowledge	Skills
• describe inherited adrenal disorders, in particular congenital adrenal hyperplasia • describe longitudinal care needs of patient with inherited adrenal disorder • describe genetic causes of inherited adrenal disorders • describe principles, properties, indications for and limitations of genetic tests for inherited adrenal disorders • describe complications of congenital adrenal hyperplasia and its treatment • describe therapeutic options for congenital adrenal hyperplasia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose inherited adrenal disorders • manage patient with congenital adrenal hyperplasia with glucocorticoid and mineralocorticoid replacement where appropriate • monitor patient with congenital adrenal hyperplasia for complications of disease and/or therapy • manage pregnant woman with congenital adrenal hyperplasia • order and interpret genetic tests (after appropriate counselling) in patient with congenital adrenal hyperplasia • discuss referral of first degree relatives of patient with congenital adrenal hyperplasia for genetic counselling where appropriate • manage other inherited adrenal disorders.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.1	Identify the normal and abnormal anatomy and physiology of the ovary and testes and hypothalamic-pituitary-gonadal axis

Knowledge

- identify normal and abnormal anatomy and physiology of the ovary and testes and hypothalamic-pituitary-gonadal axis
- describe the hormonal changes of puberty
- describe the hormonal changes of pregnancy
- describe the hormonal changes of menopause
- describe the hormonal changes of male ageing
- describe principles of management of sex hormone-sensitive conditions, including endometriosis, uterine fibroids, breast cancer and endometrial cancer.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.2	Diagnose, manage and provide care for patients with gonadal disorders

Knowledge	Skills
• describe causes of primary and secondary gonadal failure and menstrual irregularity • describe properties, principles and indications for biochemical investigation of gonadal disease, including dynamic tests • describe principles of and indications for imaging of the gonads • describe treatment strategies for gonadal disorders • describe means of pubertal induction.	• perform and interpret tests of the hypothalamopituitary-gonadal axis • investigate and manage primary and secondary gonadal failure • prescribe sex hormone replacement therapy to men and women where appropriate • assess, investigate and manage women with menstrual disturbance (primary and secondary amenorrhoea) • assess, diagnose and manage long-term administration of the oral contraceptive pill • investigate and manage common chromosomal gonadal disorders such as Turner's and Klinefelter's syndromes • describe principles of and indications for gonadal surgery as pertaining to risk of tumours associated with endocrine disease.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.3	Assess, diagnose and manage female patients with hyperandrogenism

Knowledge	Skills
• describe presentation and causes of hyperandrogenism in women • describe properties, principles and indications for biochemical investigations and their limitations in diagnosis of the female patient with hyperandrogenism • properties, principles and indications for radiological investigation of female patient with hyperandrogenism • describe complications of hyperandrogenism in women.	• assess and diagnose female patient with hyperandrogenism • order and interpret biochemical tests for female hyperandrogenism, including dynamic tests • manage female patient with hyperandrogenism with medical therapies where appropriate • refer female patient with virilising tumour for surgery where appropriate • monitor for and manage complications of hyperandrogenism, and its treatment, in female patient.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.4	Assess, diagnose and manage polycystic ovarian syndrome

Knowledge	Skills
• describe pathophysiology of polycystic ovarian syndrome (PCOS) • describe differential diagnosis of PCOS • describe complications of PCOS • describe properties, principles and indications for biochemical investigation of PCOS • properties, principles and indications for radiological investigation of PCOS • describe therapeutic options for PCOS, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose PCOS • manage the metabolic, cosmetic and reproductive problems associated with PCOS • monitor patient with PCOS for complications of disease and/or therapy • manage pregnant woman with PCOS.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.5	Assess, diagnose and manage functioning ovarian tumours

Knowledge	Skills
• describe development and pathophysiology of functioning ovarian tumours • describe investigation of patient with functioning ovarian tumour • describe complications of functioning ovarian tumours.	• assess and diagnose patient with functioning ovarian tumour • order and interpret biochemical and radiological investigations in patient with functioning ovarian tumour • manage patient with functioning ovarian tumour with medical therapies where appropriate • refer patient with functioning ovarian tumour for surgical management where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.6	Assess, diagnose and manage menopause

Knowledge	Skills
• describe physiology of menopause, and pathophysiology of premature menopause • describe investigation of patient with menopause • describe therapeutic options for menopause, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with menopause • manage patient with menopause with medical therapies according to specific symptoms and/or need for osteoporosis prevention • monitor for complications of menopause, including osteoporosis • monitor for and manage iatrogenic complications of treatments for menopause.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.7	Assess, diagnose and manage male hypogonadism

Knowledge	Skills
• describe normal and abnormal physiology of male hypogonadism, including fertility • describe properties, principles and indications for and limitations of biochemical investigation of the male patient with hypogonadism • properties, principles and indications for radiological investigation of male patient with hypogonadism • describe complications of hypogonadism in men • describe therapeutic options for hypogonadism in men, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose male patient with hypogonadism • order and interpret investigations for male hypogonadism • manage the male patient with hypogonadism with medical therapies, including androgen replacement or hCG where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.8	Assess, diagnose and manage oligo/azoospermia

Knowledge	Skills
• describe normal and abnormal physiology of sperm development • describe properties, principles and indications for and limitations of investigation of the male patient with oligo/azoospermia • describe therapeutic options for oligo/azoospermia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose male patient with oligo/azoospermia • order and interpret investigations for oligo/azoospermia • manage male patient with oligo/azoospermia with medical therapies where appropriate • refer male patient with oligo/azoospermia for specialised fertility services where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.9	Assess, diagnose and manage gynaecomastia

Knowledge	Skills
• describe normal and abnormal development of male breast • describe causes of gynaecomastia • describe properties, principles and indications for and limitations of investigation of the male patient with gynaecomastia • describe therapeutic options for gynaecomastia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with gynaecomastia • order and interpret investigations for gynaecomastia, including assessment for malignant disease • manage patient with gynaecomastia with medical therapies where appropriate • refer patient with gynaecomastia for surgical removal of breast tissue where appropriate • refer patient with gynaecomastia for oncology management where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.10	Assess, diagnose and manage functioning testicular tumours

Knowledge	Skills
• describe development and pathophysiology of functioning testicular tumours • describe investigation of patient with functioning testicular tumour • describe complications of functioning testicular tumours.	• assess and diagnose patient with functioning testicular tumour • order and interpret biochemical and radiological investigations in patient with functioning testicular tumour • manage patient with functioning testicular tumour with medical therapies where appropriate • refer patient with functioning testicular tumour for surgical management where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.11	Assess, diagnose and manage congenital gonadal disorders

Knowledge	Skills
• describe congenital gonadal disorders, in particular Turner's syndrome and Klinefelter's syndrome • describe longitudinal care needs of patient with congenital gonadal disorder • describe genetic causes of congenital gonadal disorders • describe principles, properties, indications for and limitations of genetic tests for congenital gonadal disorders • describe complications of congenital gonadal disorders • describe therapeutic options for congenital gonadal disorders, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose congenital gonadal disorders • manage patient with congenital gonadal disorder with gonadal replacement therapy where appropriate • monitor patient with congenital gonadal disorder for complications of disease and/or therapy • refer patient with congenital gonadal disorder for specialised fertility services where appropriate • order and interpret genetic tests, after appropriate counselling, in patient with congenital gonadal disorder.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.5	Reproductive Endocrinology
Learning Objective 3.5.12	Develop a diagnostic approach and management plan for patients presenting with infertility

Knowledge	Skills
• describe physiology of fertility • describe endocrine causes and mechanisms of infertility • describe indications for common endocrine investigations of infertility • describe treatment options for infertility according to specific diagnosis, including the place for therapy with anti-oestrogens, aromatase inhibitors and gonadotropins • describe indications for referral to specialised fertility services • recognise the impact of infertility on the patient and their family • describe measures to preserve gonadal function and fertility threatened by other diseases and/or therapies.	• assess and diagnose patient with infertility • identify indicators for further investigation of infertility • interpret tests in the investigation of infertility • medically manage patients with infertility due to prolactin excess • manage male patient with infertility due to other pituitary disease • manage female patient with ovarian hyperstimulation syndrome • refer patient/couple with infertility for specialised fertility services where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.1	Identify the normal and abnormal anatomy and physiology of the parathyroid glands

Knowledge
• describe normal and abnormal anatomy and physiology of parathyroid glands.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.2	Describe normal and abnormal calcium, phosphate, magnesium and skeletal homeostasis

Knowledge

- describe normal and abnormal calcium homeostasis
- describe normal and abnormal phosphate homeostasis
- describe normal and abnormal magnesium homeostasis
- describe normal and abnormal skeletal development, remodelling and ageing, including post-menopausal changes
- describe the changes in bone density and calcitropic measurements during pregnancy and lactation.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.3	Diagnose, manage and provide care for patients with hyperparathyroidism (primary, secondary and tertiary)

Knowledge	Skills
• describe normal and abnormal physiology of calcium homeostasis • describe principles of and indications for imaging of the parathyroid glands • describe differential diagnosis of hyperparathyroidism, including genetic causes: multiple endocrine neoplasia (MEN) 1, familial isolated hyperparathyroidism (FIHP), MEN 2, familial hypocalciuric hypercalcaemia (FHH), parathyroid cancer, hyperparathyroidism-jaw tumour syndrome (HPT-JT) • describe complications of primary hyperparathyroidism • describe the structure and function of the calcium-sensing receptor and the role of receptor agonists and antagonists in the management of calcium disorders.	• assess patient with hyperparathyroidism • identify patient with severe hypercalcaemia as a potential medical emergency • manage patient with hyperparathyroidism with medical therapies • identify and manage complications of primary hyperparathyroidism • identify and refer patient with primary hyperparathyroidism for parathyroid surgery where appropriate • identify and refer patient with tertiary hyperparathyroidism for parathyroid surgery where appropriate • provide perioperative care for patient undergoing parathyroid surgery • identify and manage patient with hyperparathyroidism due to underlying genetic disorder (MEN1, FIHP, MEN2, FHH, HPT-JT), including appropriate genetic counselling.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.4	Assess, diagnose and manage parathyroid hormone (PTH)-independent hypercalcaemia

Knowledge	Skills
• describe causes of PTH-independent hypercalcaemia, with particular reference to hypercalcaemia of malignancy.	• assess patient with PTH-independent hypercalcaemia • identify severe hypercalcaemia as a medical emergency • investigate PTH-independent causes of hypercalcaemia, e.g. humoral hypercalcaemia of malignancy, osteolysis, sarcoidosis, milk-alkali syndrome • manage patient with PTH-independent hypercalcaemia with medical therapies where appropriate • refer patient with PTH-independent hypercalcaemia where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.5	Assess, diagnose and manage hypocalcaemia

Knowledge	Skills
• describe congenital and acquired causes of hypocalcaemia • describe therapy of hypocalcaemia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess patient with hypocalcaemia • diagnose and manage acute hypocalcaemia • identify acute hypocalcaemia as a potential medical emergency • diagnose and manage chronic hypocalcaemia, including complications of treatment (nephrocalcinosis) • identify and manage patient with hypocalcaemia due to underlying genetic disorder (pseudohypoparathyroidism, hypoparathyroidism, calcium-sensing receptor gene abnormalities and vitamin D/receptor abnormalities), including appropriate genetic counselling.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.6	Assess, diagnose and manage osteoporosis

Knowledge	Skills
• identify normal and abnormal physiology of skeletal development and homeostasis (bone modelling and remodelling), including functions of osteoblasts, osteoclasts and osteocytes, and properties of bone collagen and bone mineral • describe structural elements that contribute to skeletal fragility • describe properties, principles, indications for and limitations of bone densitometry • describe properties, principles, indications for and limitations of measuring markers of bone turnover • describe indications for radiography in assessment of osteoporosis • describe properties, principles, indications for and limitations of performing bone biopsy • describe risk factors for osteoporosis • describe secondary causes of osteoporosis, and appropriate investigations for these • describe treatment strategies for osteoporosis.	• assess patient with osteoporosis • develop a diagnostic approach and management plan for patients presenting with osteoporosis, reduced bone mass or skeletal fragility • make appropriate referrals for bone densitometry • provide preventive care against osteoporosis • assess, diagnose and manage post-menopausal osteoporosis • assess, diagnose and manage osteoporosis in men • assess, diagnose and manage nutritional osteoporosis, including bone disease associated with anorexia nervosa and coeliac disease • identify, manage, and refer as appropriate, patient with secondary osteoporosis, including, rheumatoid arthritis, hyperparathyroidism, hyperthyroidism, glucocorticoid excess, and plasma cell dyscrasia.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.7	Assess, diagnose and manage osteomalacia or rickets

Knowledge	Skills
• describe causes of osteomalacia or rickets • describe risk factors for vitamin D deficiency, including dietary factors and ethnicity.	• assess, diagnose and manage patient with osteomalacia or rickets due to vitamin D deficiency, and identify family members who might also be at risk • assess, diagnose and manage patient with osteomalacia or rickets due to other causes • order and interpret bone biopsy where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.8	Assess, diagnose and manage hypophosphataemia

Knowledge	Skills
• describe inherited and acquired causes of hypophosphataemia • describe role of hormones (FGF23, PTH, vitamin D) in maintaining normophosphataemia • describe medical therapy of hypophosphataemia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with hypophosphataemia • manage hypophosphataemia with medical therapies • refer patient with tumour-induced osteomalacia for surgery and/or radiofrequency ablation where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.9	Assess, diagnose and manage Paget's disease of bone and other sclerosing bone disorders

Knowledge	Skills
• describe pathophysiology of Paget's disease of bone • describe clinical and biochemical markers for activity of Paget's disease of bone • describe utility of imaging techniques in diagnosis of Paget's disease of bone • describe complications of Paget's disease of bone • describe the genetics of familial Paget's disease of bone • describe causes of congenital and acquired osteosclerosis.	• assess patient with Paget's disease of bone • manage patient with Paget's disease of bone with medical therapies where appropriate • refer patient with Paget's disease for orthopaedic surgery where appropriate • refer patient with Paget's disease to audiologist where appropriate • assess, diagnose and manage patient with osteosclerosis.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.10	Assess, diagnose and manage renal calculi due to endocrine disease

Knowledge	Skills
• describe endocrine and metabolic causes of renal calculi.	• assess, diagnose and manage medically patient with underlying metabolic causes for nephrolithiasis.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.6	Parathyroid Glands, Calcium Disorders and Bone
Learning Objective 3.6.11	Assess, diagnose and manage the adult with inherited disorders of the skeleton (skeletal dysplasias such as osteogenesis imperfecta, hyperostosis, fibrous dysplasias)

Knowledge	Skills
• describe cause and consequences of osteogenesis imperfecta • describe therapy of osteogenesis imperfecta, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives, including bisphosphonates • describe inherited high bone mass syndromes.	• assess and diagnose adult patient with inherited skeletal disorder • manage adult patient with inherited skeletal disorder.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.7	Disorders of Appetite and Weight
Learning Objective 3.7.1	Assess, diagnose, and manage patients with disorders of appetite and weight

Knowledge	Skills
• explain principles of body composition • describe physiology of energy balance • describe epidemiology of obesity • describe endocrine and other secondary causes of obesity • describe genetic causes of obesity • explain endocrine consequences of anorexia nervosa, bulimia and obesity • describe medical and surgical treatment options for obesity.	• assess, diagnose, and manage patient with disorders of appetite and weight • investigate obese patient in order to exclude endocrine causes • assess and diagnose and manage endocrine disturbance in anorexia nervosa • initiate management of obese patient • recognise and refer patient requiring surgery for management of obesity.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.8	Neuroendocrine Tumours
Learning Objective 3.8.1	Identify the normal and abnormal anatomy and physiology of the neuroendocrine system

Knowledge
• identify the normal and abnormal anatomy and physiology of the neuroendocrine system.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.8	Neuroendocrine Tumours
Learning Objective 3.8.2	Assess, diagnose and manage patients with neuroendocrine tumours

Knowledge	Skills
• identify normal and abnormal anatomy and physiology of neuroendocrine tissue • describe the classification of neuroendocrine tumours • describe properties, principles and indications for biochemical investigation of neuroendocrine disorders, including dynamic testing • describe principles of and indications for imaging of neuroendocrine tumours, including the role of nuclear medicine • describe therapeutic modalities for patient with neuroendocrine tumours.	• assess patient with neuroendocrine tumours, including clinical, biochemical, and radiological assessment • diagnose and manage patient with neuroendocrine tumours medically, including chronic management and acute medical management perioperatively and in the setting of tumour ablation • participate in multidisciplinary management of patients with neuroendocrine tumours.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.9	Lipid Disease
Learning Objective 3.9.1	Assess, diagnose and manage disorders of lipid metabolism

Knowledge	Skills
• describe normal and abnormal lipid metabolism • describe congenital and acquired causes of dyslipidaemias • outline nutritional contributors to dyslipidaemia • describe investigations for dyslipidaemias • describe principles of screening for dyslipidaemia, in particular in patient with diabetes and other high risk groups • describe complications of hypercholesterolaemia • describe complications of hypertriglyceridaemia • describe therapy of dyslipidaemias, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient with dyslipidaemias • select appropriate patient to screen for dyslipidaemia • assess cardiovascular risk in relation to the patient's lipid profile • manage patient with primary and secondary dyslipidaemias • communicate cardiovascular risk of hyperlipidaemia to patients • refer patient with atypical or severe dyslipidaemia to other specialist services where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.1	Assess, diagnose and mange non-iatrogenic hypoglycaemia

Knowledge	Skills
• describe causes of non-iatrogenic hypoglycaemia • describe biochemical investigations for non-iatrogenic hypoglycaemia, including dynamic tests and arterial sampling • describe imaging investigations for non-iatrogenic hypoglycaemia • describe complications of non-iatrogenic hypoglycaemia • describe therapy of non-iatrogenic hypoglycaemia, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess and diagnose patient presenting with hypoglycaemia • order and interpret investigations for hypoglycaemia • manage patient with non-iatrogenic hypoglycaemia, including referral for surgery and/ or chemotherapy as needed.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.2	Assess, diagnose and manage syndrome of inappropriate antidiuretic hormone secretion (SIADH)

Knowledge	Skills
• describe the clinical and biochemical scenario of SIADH • describe the common central nervous system (CNS) and other causes of SIADH • describe investigation of SIADH and its differentiation from cerebral salt wasting (CSW) and fluid overload • describe acute and sub-acute management of SIADH • describe vasopressin receptors and the role of antagonists in management of SIADH.	• assess patient with hyponatraemia • diagnose and manage patient with SIADH in the acute and sub-acute setting • diagnose and manage CSW • monitor patient during therapy to correct water and electrolyte balance.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.3	Assess, diagnose and manage humoral complications of cancer

Knowledge	Skills
• describe humoral complications of cancer, including ectopic ADH, ACTH, PTHrP and human chorionic gonadotropin (hCG) • describe properties, principles, indications for and limitations of assays for ADH, ACTH, PTHrP and hCG • describe therapy of humoral complications of cancer, including the indications, use, risks, monitoring and expected outcomes for different therapeutic alternatives.	• assess, diagnose and manage humoral complications of cancer.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.4	Assess, diagnose and manage endocrine late effects of cancer

Knowledge	Skills
• describe late effects of cancer management on endocrine organs and systems.	• assess, diagnose and manage endocrine late effects of cancer.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.5	Assess, diagnose and manage multiple endocrine neoplasia (MEN) syndromes

Knowledge	Skills
• describe pathophysiology and genetics of MEN syndromes • describe appropriate genetic testing for MEN syndromes • describe investigation for components of MEN, including appropriate surveillance in follow-up and timely referral for thyroidectomy for patient with MEN2 • describe inheritance of MEN syndromes and importance of genetic counselling.	• assess, diagnose and manage patient with MEN syndromes • refer patient with MEN syndrome for tumour surgery where appropriate • order and interpret genetic tests for MEN syndromes, after appropriate counselling • discuss referral of family members of patient with MEN syndrome for genetic counselling, where appropriate.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.6	Assess, diagnose and manage autoimmune polyendocrinopathy syndromes

Knowledge	Skills
• describe types of autoimmune polyendocrinopathy syndromes • describes congenital and acquired causes of autoimmune polyendocrinopathy syndromes • describe appropriate surveillance for organ dysfunction in patient with autoimmune polyendocrinopathy syndrome	• assess, diagnose and manage patient with autoimmune polyendocrinopathy syndrome.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.6	Assess, diagnose and manage autoimmune polyendocrinopathy syndromes

• describe risk in first degree relatives of autoimmune polyendocrinopathy syndromes • describe treatments for autoimmune polyendocrinopathy syndromes.	

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.7	Assess, diagnose and manage endocrine disorders secondary to infectious disease, including HIV

Knowledge	Skills
• describe endocrine complications of HIV • describe endocrine complications of tuberculosis • describe endocrine complications of other common infectious diseases.	• assess, diagnose and manage endocrine disorders secondary to infectious disease • manage endocrine complications of treatment for infectious disease, including lipodystrophy.

DOMAIN 3	ENDOCRINE SYSTEMS AND DISORDERS
Theme 3.10	Integrative Endocrinology
Learning Objective 3.10.8	Assess, diagnose and manage endocrine manifestations of haemochromatosis

Knowledge	Skills
• describe types of haemochromatosis • describe genetic causes of haemochromatosis • describe endocrine complications of haemochromatosis.	• assess, diagnose and manage patient with endocrine manifestations of haemochromatosis.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.1	Develop a diagnostic approach and management plan for polydipsia and polyuria

Knowledge	Skills
• describe endocrine causes and mechanisms of polydipsia and polyuria • describe renal physiology related to glucose, water and calcium handling • describe indications for specific endocrine investigations for polydipsia and polyuria, including plasma glucose, and/or tolerance test, serum calcium, serum and urine sodium/osmolarity, and water deprivation test • describe treatment for polydipsia and polyuria according to specific diagnosis.	• assess and diagnose patient presenting with polydipsia and polyuria • identify indicators for further investigation of polydipsia and polyuria • order and interpret tests in the investigation of polydipsia and polyuria • determine the cause of polydipsia or polyuria and diagnose accordingly • develop a management plan for patient.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.2	Develop a diagnostic approach and management plan for weight gain

Knowledge	Skills
• describe endocrine causes and mechanisms of weight gain • describe indications for common endocrine investigations of weight gain, including glucose, thyroid function tests, cortisol (including urinary free cortisol), and dynamic tests • describe indications for investigation of rare endocrine causes of weight gain, including hypothalamic disturbance • describe treatment for promoting weight loss according to specific diagnosis.	• assess and diagnose patient presenting with weight gain • identify indicators for further investigation of weight gain • order and interpret tests in the investigation of weight gain • develop a management plan for the patient with weight gain.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.3	Develop a diagnostic approach and management plan for weight loss

Knowledge	Skills
• describe endocrine causes and mechanisms of weight loss • describe indications for common endocrine investigations of weight loss, including glucose, thyroid function tests, and cortisol, including dynamic tests • describe indications for investigation of rare endocrine causes of weight loss, including neuroendocrine tumours, hypothalamic disturbance • describe treatment for promoting weight gain according to specific diagnosis.	• assess and diagnose patient presenting with weight loss • identify indicators for further investigation of weight loss • order and interpret tests in the investigation of weight loss • develop a management plan for patient with weight loss.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.4	Develop a diagnostic approach and management plan for erectile dysfunction/loss of libido

Knowledge	Skills
• describe endocrine causes and mechanisms of erectile dysfunction/loss of libido • describe physiology of libido and erectile function • describe indications for common endocrine investigations of erectile dysfunction/loss of libido • describe treatment for erectile dysfunction/loss of libido according to specific diagnosis • describe indication for referral to specialised andrology services.	• assess and diagnose patient presenting with erectile dysfunction/loss of libido • identify indicators for further investigation of erectile dysfunction/loss of libido • order and interpret tests in the investigation of erectile dysfunction/loss of libido • develop a management plan for patient with erectile dysfunction/loss of libido.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.5	Develop a diagnostic approach and management plan for menstrual disturbance

Knowledge	Skills
• describe physiology of normal menstrual cycle • describe endocrine causes and mechanisms of oligo/amenorrhoea • describe endocrine causes of metromenorrhagia • describe indications for common endocrine investigations of menstrual disturbance, including pregnancy tests, prolactin, LH/FSH, estradiol, progesterone, thyroid function tests, karyotype, pelvic sonography, and hypothalamic/pituitary imaging • describe indication for investigation for rare endocrine conditions associated with menstrual disturbance, including inherited disorders of sexual development • describe treatment for menstrual disturbance according to specific diagnosis.	• assess and diagnose patient presenting with menstrual disturbance • identify indicators for further investigation of menstrual disturbance • order and interpret tests in the investigation of menstrual disturbance • develop a management plan for patient with menstrual disturbance.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.6	Develop a diagnostic approach and management plan for bone pain and/or fracture

Knowledge	Skills
• describe endocrine causes and mechanisms of bone pain and/or fracture • describe pathophysiology of bone fragility • describe indications for common endocrine investigations of bone pain and/or fracture, including serum measurements (alkaline phosphatase, calcium, phosphate, magnesium, PTH, 25OHD, thyroid function, IEPG/EPG, celiac serology, bone turnover markers), urinary measurements (bone turnover markers), skeletal radiology and nuclear imaging, and bone mineral densitometry • describe treatment for bone pain and/or fracture according to specific diagnosis	• assess and diagnose patient presenting with bone pain and/or fracture • identify indicators for further investigation of bone pain and/or fracture • order and interpret tests in the investigation of bone pain and/or fracture • develop a management plan for patient with bone pain and/or fracture.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.6	Develop a diagnostic approach and management plan for bone pain and/or fracture
• describe indication for referral to orthopaedic/bone repair services.	

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.7	Develop a diagnostic approach and management plan for hirsutism
Knowledge	**Skills**
• describe endocrine causes and mechanisms of hirsutism • describe physiology of androgen-dependent hair growth • describe indications for common endocrine investigations of hirsutism, including serum (cortisol, testosterone, sex hormone-binding globulin (SHBG), androstenedione, dehydroepiandrosterone sulfate (DHEAS), 17-hydroxyprogesterone, LH, FSH, estradiol, progesterone, thyroid function), urine (cortisol), and abdominal or pelvic imaging • describe indications for investigation of rare endocrine causes of hirsutism, including venous sampling for virilising tumours of adrenal gland/ovary, genetic tests for congenital adrenal hyperplasia (CAH) • describe treatment for hirsutism according to specific diagnosis.	• assess and diagnose patient presenting with hirsutism • identify indicators for further investigation of hirsutism • order and interpret tests in the investigation of hirsutism • develop a management plan for patient with hirsutism.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.8	Develop a diagnostic approach and management plan for anterior neck lumps

Knowledge	Skills
• describe endocrine causes of anterior neck lumps • describe indications for common endocrine investigations of anterior neck lumps, including fine needle aspiration cytology (FNAC).	• assess and diagnose patient presenting with neck lumps • order and interpret tests in the investigation of anterior neck lumps • develop a management plan for patient with an anterior neck lump.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.9	Develop a diagnostic approach and management plan for hypertension

Knowledge	Skills
• describe endocrine causes of hypertension • describe indications for common endocrine investigations of hypertension.	• assess and diagnose patient presenting with hypertension • order and interpret tests in the investigation of hypertension • develop a management plan for patient with hypertension.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.10	Develop a diagnostic approach and management plan for flushing and/or sweating

Knowledge	Skills
• describe endocrine causes and mechanisms of flushing • identify indicators for further investigation of flushing • describe pathophysiology of flushing • describe indications for common endocrine investigations of flushing, including serum measurements (gonadal steroids, gonadotropins, thyroid function, calcitonin, mast cell tryptase, chromogranin A), urine measurements (serotonin, 5-hydroxyindoleacetic acid (HIAA), catecholamines), and imaging (CT scans, octreotide scanning) • describe treatment for flushing according to specific diagnosis.	• assess and diagnose patient presenting with flushing and/or sweating • order and interpret tests in the investigation of flushing or sweating • develop a management plan for patient with flushing or sweating.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.11	Develop a diagnostic approach and management plan for fatigue

Knowledge	Skills
• describe endocrine causes and mechanisms of fatigue • describe pathophysiology of fatigue • describe indications for common endocrine investigations of fatigue, including serum measurements (electrolytes, calcium, 25OHD, thyroid function, glucose, dynamic cortisol measures) • describe treatment for fatigue according to specific diagnosis.	• assess and diagnose patient presenting with fatigue • identify indicators for further investigation of fatigue • order and interpret tests in the investigation of fatigue • develop a management plan for patient with fatigue.

DOMAIN 4	APPROACHES TO COMMON PRESENTING PROBLEMS
Theme 4.1	Approaches to Common Presenting Problems
Learning Objective 4.1.12	Develop a diagnostic approach and management plan for galactorrhoea

Knowledge	Skills
• describe endocrine causes and mechanisms of galactorrhoea • describe indications for common endocrine investigations of galactorrhoea.	• assess and diagnose patient presenting with galactorrhoea • order and interpret tests in the investigation of galactorrhoea • develop a management plan for patient with galactorrhoea.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.1	Laboratory Investigations
Learning Objective 5.1.1	Order and interpret relevant laboratory investigations for patients with endocrine disease, including endocrine hormone assays and dynamic endocrine testing

Knowledge	Skills
• describe the range of baseline biochemical tests used to investigate endocrine disorders • describe laboratory processes and limitations involved in sample collection, storage, preparation and hormone measurement • describe the indications for use, processes and limitations of endocrine hormone assays and their limitations • describe the histopathology of endocrine tumours, including fine needle biopsies of the thyroid gland.	• order and interpret appropriate tests in a suspected endocrine condition.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.2	Radiology
Learning Objective 5.2.1	Order and interpret radiological investigations

Knowledge	Skills
• describe the basis of estimation of bone age • describe the use of skeletal x-rays in suspected bone and mineral disorders • describe the use of MRI investigation for pituitary, hypothalamic, pancreas, adrenal and ovarian disorders • describe the use of CT scanning in endocrine disease.	• order and interpret bone age using validated methodology (e.g. Greulich and Pyle or Tanner Whitehouse) • order and interpret skeletal x-rays and recognise abnormalities pertaining to endocrine disorders • integrate results of radiological investigations into the diagnostic formulation for endocrine disease.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.2	Radiology
Learning Objective 5.2.2	Order and interpret ultrasound investigations

Knowledge	Skills
• describe principles, properties, indications for and limitations of diagnostic ultrasound in endocrine disorders.	• order and interpret diagnostic ultrasound in endocrine disorders • integrate results of ultrasound investigations into the diagnostic formulation for endocrine disease.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.3	Nuclear Medicine
Learning Objective 5.3.1	Order and interpret nuclear medical imaging in endocrine disease

Knowledge	Skills
• describe the principles, properties, indications for and limitations of nuclear medicine imaging in diagnosis of endocrine disorders, including functional or malignant disorders • describe therapeutic applications of nuclear isotopes, including use in diseases of the thyroid, adrenal, and neuroendocrine system • describe principles, properties, indications for and limitations of PET.	• order and interpret thyroid scans, including labelled technetium uptake and radioactive iodine total body scans • order and interpret bone scans, MIBG scans, octreotide scans • order and interpret PET scans in endocrine disorders, including use of FDG, F-DOPA and gallium octreotate • integrate results of nuclear medicine investigations into the diagnostic formulation for endocrine disease • order and/or refer appropriate patient for radionuclide ablation.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.4	Measurement of bone density and structure
Learning Objective 5.4.1	Order and interpret bone densitometry investigations

Knowledge	Skills
• describe properties, principles, indications for and limitations of measurement of bone densitometry using DXA, including the need for specific age and sex matched reference ranges.	• order and interpret bone densitometry investigations • integrate results of bone densitometry investigations into the diagnostic and management formulation for endocrine disease.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.4	Measurement of bone density and structure
Learning Objective 5.4.2	Order and interpret quantitative bone ultrasound and quantitative CT assessment of bone density

Knowledge	Skills
• describe properties, principles, indications for and limitations of measurement of quantitative bone ultrasound, including the need for specific age and sex matched reference ranges • describe the indications for measurement of bone densitometry using peripheral quantitative computed tomography (pQCT).	• interpret quantitative bone ultrasound investigations • order and interpret quantitative CT assessment of bone density where appropriate.

DOMAIN 5	PRINCIPLES OF ANALYTICAL METHODS
Theme 5.5	Research Methods
Learning Objective 5.5.1	Outline and apply research methods

Knowledge
• outline the principles of research methods, including interventional clinical trials (phase I-IV), other clinical research (case report/series, cohort, case-control, public health/epidemiology), genetic epidemiology, laboratory-based research (polymerase chain reaction (PCR) and sequencing, molecular and cell biology, tissue/tumour array, animal models).

DOMAIN 6	PROFESSIONAL QUALITIES SPECIFIC TO ENDOCRINOLOGY
Theme 6.1	Professional Qualities of the Endocrinologist
Learning Objective 6.1.1	Access, assess and apply guidelines and consensus statements for clinical practice with respect to endocrine disorders

Skills
• access, assess and apply guidelines and consensus statements for clinical practice with respect to endocrine disorders.

DOMAIN 6	PROFESSIONAL QUALITIES SPECIFIC TO ENDOCRINOLOGY
Theme 6.1	Professional Qualities of the Endocrinologist
Learning Objective 6.1.2	Counsel and educate endocrine patients and their families on management of endocrine disorders
Skills	
• counsel patient with chronic endocrine or metabolic disease • educate patients, their families and other health professionals regarding endocrine disorders and the impact of disease on the endocrine system • educate patient on prevention of endocrine disorders • provide lifestyle education to prevent and minimise endocrine disorders, including diabetes, obesity and calcium and vitamin D deficiencies.	

DOMAIN 6	PROFESSIONAL QUALITIES SPECIFIC TO ENDOCRINOLOGY
Theme 6.1	Professional Qualities of the Endocrinologist
Learning Objective 6.1.3	Advocate for endocrine patients
Skills	
• advocate for services, resources and rights of patient with diabetes • advocate for services, resources and rights of patient with chronic endocrine disorders.	

APPENDIX

ACRONYMS AND INITIALISMS

ACTH	adrenocorticotropic hormone
ADH	antidiuretic hormone
AVP	arginine vasopressin
CAH	congenital adrenal hyperplasia
CNS	central nervous system
CRH	corticotropin-releasing hormone
CSII	continuous subcutaneous insulin infusion
CSW	cerebral salt wasting
DDAVP	desmopressin
DHEAS	dehydroepiandrosterone sulfate
DXA	dual energy x-ray absorptiometry
FGF23	fibroblast growth factor 23
FHH	familial hypocalciuric hypercalcaemia
FIHP	familial isolated hyperparathyroidism
FNAC	fine needle aspiration cytology
FSH	follicle-stimulating hormone
GH	growth hormone
GHRH	growth-hormone-releasing hormone
GIP	gastric inhibitory polypeptide
GLP	glucagon-like peptide
GnRH	gonadotropin-releasing hormone
hCG	human chorionic gonadotropin
HIAA	hydroxyindoleacetic acid
HPT-JT	hyperparathyroidism-jaw tumour syndrome
IGF	insulin-like growth factor
LH	luteinizing hormone
MDII	multiple daily intermittent injection

ACRONYMS AND INITIALISMS	
MEN	multiple endocrine neoplasia
PCOS	polycystic ovarian syndrome
PCR	polymerase chain reaction
pQCT	peripheral quantitative computed tomography
PTH	parathyroid hormone
PTHrP	parathyroid hormone-related protein
SHBG	sex hormone-binding globulin
SIADH	syndrome of inappropriate antidiuretic hormone secretion
TRH	thyrotropin-releasing hormone
TSH	thyroid-stimulating hormone
TSHoma	TSH-secreting pituitary adenoma