## Section and Board of Endocrinology

# European Training Requirements for the Specialty of Endocrinology, Diabetes and Metabolism

## *European Standards of Postgraduate Medical Specialist Training*

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## Section and Board of Endocrinology

The joint UEMS Section and Board of Endocrinology/European Society of Endocrinology Curriculum and European Training Requirement document incorporates the ESE Recommended Curriculum of Specialisation in Endocrinology published in 2017, updated in 2019, endorsed by 53 national societies of endocrinology, and the delegates of the UEMs Section and Board of Endocrinology as well as the UEMS European Training Requirement (ETR) ratified in 2018 by UEMS Council.

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In 2023 the joint ESE/UEMS-SBE Curriculum and European Training Recommendations were developed by a task force comprising Anton Luger and Maeve Durkan (obo UEMS-SBE and ESE), Mirjam Christ- Crain and Pedro Marques (obo ESE) with the input of

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EYES Committee
ESE Education Committee
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Relevant references and publications were updated. Finally, six Entrustable Professional Activities (EPAs) applicable in endocrine training as guidance for those countries/institutions who voluntarily wish to utilise such tools in endocrine postgraduate training and assessment are included in Appendix 1.

The UEMS Section and Board of Endocrinology ETR, in accordance with UEMS policy, aims at setting standards of knowledge, skills, and competencies that specialists must acquire during their post-graduate training in order to practice independently and safely in their chosen specialty. The final responsibility to define the duration, content, organization and assessment of postgraduate education remains with the national authorities. Individual countries may decide to use this ETR for quality control or partly or in total as their national postgraduate training requirement.

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# I. INTRODUCTION

## 1. UEMS Preamble

The UEMS (Union Européenne des Médecins Spécialistes, or European Union of Medical Specialists) is a non-governmental organisation representing national associations of medical specialists at the European level. Its current membership is 42 national associations; it operates through 43 Specialist Sections and their European Boards, 17 Multidisciplinary Joint Committees and 4 Thematic Federations. The UEMS is committed to promoting the free movement of medical specialists across Europe, while ensuring a professional consensus on the framework for the highest possible level of their training; the aim of this is to pave the way for the improvement of the quality of specialist care for the benefit of all European citizens and beyond.

**UEMS and its Postgraduate Medical Specialists Training programmes**. In 1994, the UEMS adopted its Charter on Postgraduate Training, aiming at providing the recommendations at the European level for high quality training. This Charter set the basis for the European approach in the field of harmonisation of Postgraduate Specialist Medical Training, most importantly with the ongoing dissemination of its periodically updated Chapter 6's, specific to each specialty. Since the most recent version of the EU Directive on the recognition of Professional Qualifications was introduced in 2011, the UEMS Specialist Sections and other UEMS Bodies have continued working on developing the documents on European Training Requirement(s) (ETRs). They reflect modern medical practice, current scientific findings and particular competencies in each of the specialty fields represented within the UEMS. In 2012 the UEMS Council adopted the document Template Structure for ETR.

**The linkage between the quality of medical care and quality of training of medical professionals**. It is the conviction of the UEMS that the quality of medical care and expertise are directly linked to the quality of training, the achieved competencies and their continuous update and development provided to the medical professionals. No matter where doctors are trained, they should have the same core competencies. The UEMS ETRs reflect many years of experience on the ground of the UEMS Sections, Multidisciplinary Joint Committees (MJCs) and Boards, in close collaboration with the relevant European Scientific Societies, developing training requirements coupled with European Medical Assessments. One of the clear aims of the UEMS ETRs is to raise standards of training, to ensure that European patients find high quality specialist care. Professional activity is regulated by national laws in each of the European countries; it is the UEMS understanding that it has to comply with international treaties and UN declarations on Human Rights as well as the WMA International Code of Medical Ethics.

**UEMS and European legislation facilitating the mobility of medical professionals**. The UEMS Council and its Specialist Sections, first created in 1962, have regularly provided advice and expert opinion to the European Commission. This helped create the framework that informed the drawing up of the Doctors Directives in 1975, which provided for the

mutual recognition of medical diplomas and the free movement of doctors throughout the EU. The revised EU Directive on the recognition of Professional Qualifications (2013/55/EU) allows member states to decide on a common set of minimum knowledge, skills and competencies that are needed to pursue a given profession through a Common Training Framework (CTF) which represents the third mechanism that could be used to ensure mobility within the EU. This directive states that "professional qualifications obtained under common training frameworks should automatically be recognised by Member States. Professional organisations which are representative at European Union level and, under certain circumstances, national professional organisations or competent authorities should be able to submit suggestions for common training principles to the Commission, in order to allow for an assessment with the national coordinators of the possible consequences of such principles for the national education and training systems, as well as for the national rules governing access to regulated professions". The UEMS has supported CTFs since they encompass the key elements developed in modern educational and training models, i.e. knowledge, skills and professionalism. In addition, the Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 on the application of patients' rights in cross-border healthcare introduced a strong incentive for harmonisation of medical training and achieved competencies among EU/EEA Countries through the requirements to assure good and comparable quality of care to increasingly mobile European citizens.

The UEMS ETR documents aim to provide for each specialty the basic training requirements as well as optional elements; they should be regularly updated by UEMS Specialist Sections and European Boards to reflect scientific and medical progress. The three-part structure of these documents reflects the UEMS approach, to have a coherent pragmatic document for each individual specialty, not only for medical specialists but also for decision-makers at the national and European level interested in knowing more about medical specialist training. To foster harmonisation of the ETR by adopting more specific guidelines, the CanMEDS (8) competency framework is recommended; this defines the entire set of roles of the professionals which are common across both medicine and surgery. UEMS has an agreement to use an abbreviated version of the competencies within those roles.

**Importance of making a distinction between Knowledge and Competency in ETR documents**. Competency-based education is not oriented towards the period of clinical rotations, but towards the trainee and their progress in the acquisition of competencies. Having a clear distinction in an ETR between competencies and knowledge helps define both how that training should be delivered and how it should be assessed. The UEMS considers that the appropriate use of different methods of assessment of knowledge and acquired skills, emphasising the workplace-based assessment, is an essential component of quality postgraduate training, focused on high standards of specialist medical practice. To improve the methods of assessment, it is also recommended to use Entrustable Professional Activities (EPAs) in ETRs. In order to promote common and harmonised standards on the quality assurance in specialist training and specialist practice at a European level, some UEMS Specialist Sections and Boards also organise European examinations; these are supported and appraised by the UEMS through the Council of European Specialist Medical Assessments (CESMA).

**Overlapping of learning outcomes and competencies**. Each of the UEMS ETRs defines a syllabus or knowledge base and describes learning outcomes defined for given competencies. Some of these curricula encompass a whole specialty, others focus on areas within or across specialties and define content of the training requirements for specific areas of expertise. By recognising the potential overlapping it creates the opportunity for those writing ETRs to draft overlapping or common goals for learning outcomes. Similar measurement does not necessarily equate to the same targets. Rather, across different specialties the final goal may differ, i.e. there may be clearly defined individual goals for trainees with different expectations.

**UEMS ETRs and national curricula**. The UEMS strongly encourages the National Medical Competent Authorities (NMCAs) to adopt such requirements and believes that this is the most effective way to implement good standards in postgraduate training. We clearly respect and support the vital role of the NMCAs in setting high standards of training and care in their respective countries and checking through robust quality control mechanisms the qualifications of medical specialists moving across Europe. The UEMS ETRs are developed by professionals for professionals and this adds unique value to them. The UEMS aim is to describe the knowledge and competencies that should be achieved by trainees in European countries, and also the competencies and organisation of the training centres. The training environment and results described in UEMS ETRs may be achieved in adapted ways, depending on local traditions and the organisation of healthcare system and medical specialist training. Adaptation of UEMS ETRs to local conditions encourages the highest quality of specialist training; each state may include additional requirements, depending on local needs.

**Importance of collaboration with other representative European medical bodies**. The UEMS always wishes to work with colleagues, NMAs, professional and scientific organisations across Europe. In the process of ETR development, the UEMS recognises the importance of meaningful collaboration with the other European medical representative bodies, the European Junior Doctors (EJD representing doctors in training), the European Union of General Practitioners (UEMO – Union Européenne des Médecins Omnipraticiens), the Standing Committee of European Doctors (CPME - Comité Permanent des Médecins Européens), the Federation of European Salaried Doctors (FEMS) and the European Association of Senior Hospital Doctors (AEMH - Association Européenne des Médecins Hospitaliers). In addition, UEMS continues to develop closer links with the many European specialist societies. UEMS, in collaboration with its fellow European representative bodies, has constantly been highlighting the importance of coordinated postgraduate specialist medical training programmes always accepting the differing needs of different specialties. In this way quality medical care is delivered by highly qualified medical specialists - essential to ensuring consumer confidence and protection all over Europe.

**Conclusions**. UEMS is very proud for all the hard work that has been done until now in developing the UEMS ETRs as well as that they are increasingly implemented as national curricula. However, we also recognise the need for constant improvement, and we are always open to further suggestions. The UEMS insists that the medical profession remains

the driver in defining its own specialist training and continuous professional development needs. On this basis, we sincerely look forward to working with the key European Union responsible bodies, as well as the national stakeholders in implementing the basic common strategies and requirements outlined with this initiative. We are confident that the priorities detailed in UEMS ETR documents developed for individual specialties (and/or competencies) will become evident in national strategies and programmes, as well as action plans for postgraduate medical education and training.

## 2. Specialty of Endocrinology, Diabetes and Metabolism

Endocrinology is the branch of medicine concerned principally with structural and functional disorders of the endocrine glands, of hormone action and the metabolic consequences thereof. The specialty of Endocrinology comprises Endocrinology, Diabetes, Metabolism, Nutrition, Andrology, Reproductive and Sexual Medicine; in this ETR, this is abbreviated to Endocrinology.

**Aims of the Specialty**

The Section and Board of Endocrinology aims to instill a holistic approach - expert clinician, academic scholar, professional leader, collaborator, communicator, health advocate , inspired humanitarian – as promulgated in the CanMEDS model.

Since hormones act on virtually every organ and cell type in the body, the endocrinologist has to apply a wide experience in general medicine. Some disorders lie clearly and completely within the domain of the endocrinologist (as for example thyroid disease). Other disorders are not exclusively endocrine in origin, but have important endocrine aspects (as for example osteoporosis and metabolic bone disease, infertility and cancer). The endocrinologist is thus often the most appropriate physician to provide medical care, or to coordinate it where a multidisciplinary approach is needed. The endocrinologist will also need to develop and maintain skills in acute and chronic aspects of General Internal Medicine. Faced with an increasing proliferation of tests and new diagnostic and therapeutic procedures, the endocrinologist often has an important role in defining the most efficient and cost-effective strategy for their use in patient care. High-level communication and organisational skills are central to the practice of Endocrinology, both in relation to direct patient care and to the work of multidisciplinary teams.

The UEMS Section and Board of Endocrinology has worked with the European Society for Endocrinology (ESE) to agree a common curriculum for training in Endocrinology in Europe. This also provides the basis for the European Board Examination in Endocrinology, Diabetes and Metabolism (EBEEDM. The aim is to promote harmonisation of training, to encourage patient-centred endocrinology training and ultimately ~~to promote high~~ standards of care and optimal patient outcomes.

The ESE/UEMS Curriculum and ETR represent the current training practice in most European countries and supports a high level of a medical training standard that will pave the way to patient safety and first-class quality of care for the benefit of all European citizens with endocrine diseases. The listed competencies in general core domains should be achievable by most national training programmes, even in the presence of considerable national variations due to, e.g. infrastructure, resources, manpower, laws, financing, and traditions. Basic competence levels proposed in specific core domains may serve to stimulate implementation of education and training plans in European hospitals. For instance, those hospitals not offering training possibilities in specific core domain competencies may consider forming training units with other training hospitals where such training is provided. By this approach, the ESE/UEMS Curriculum and ETR may foster future clinical exchange programmes between hospitals and may encourage the use of different learning modalities, e.g. medical simulation centres.

The ESE/UEMS Curriculum and ETR is intended to offer a comprehensive and robust training framework created by medical specialists and based on assembled Europe-wide educational and training experience. The framework covers the essential knowledge, skills and competences that a minimally competent candidate must achieve prior to completion of training in Endocrinology. It is intended to guide and complement individual national/institutional training programs in this mission whilst leaving adoption or inclusion of any additional skills, competences and practices that individual countries and institutions may wish to add in cognizance of local needs and practices at the discretion of such organisations. Another advantage of specialists trained according to the ESE/UEMS Curriculum and ETR will be to facilitate professional mobility across Europe. Qualifications will automatically be recognised in other EU countries as established by EU law (Directive 2005/36/EC).

Attaining full competencies in all domains of the broad discipline of Endocrinology in the minimum training timeframe is ideally the level of excellence to strive for. However, it has to be acknowledged that, on a regional, national and international level there are limitations imposed by a variety of factors, including human, financial and infrastructural resources. The commitment to lifelong learning and continuing professional development after completion of specialist training must be therefore nurtured and supported.

**Procedure of ETR Development/ Revision/Update**

This ESE/UEMS Curriculum/European Training Recommendations (ETR) is based on the ESE Recommended Curriculum of Specialisation in Clinical Endocrinology, Diabetes and Metabolism published in 2017, and updated in 2019, which was endorsed by 53 national societies of endocrinology, and on the ETR which was endorsed by the delegates of the UEMS Section and Board of Endocrinology and ratified by the UEMS Council in 2018.

The ESE Curriculum has been developed by the ESE's Education Committee, which reviewed and compared curricula from across Europe and established the key criteria required to practise as a clinical endocrinologist, listing the areas in which an endocrinologist should be proficient. The Working Group appointed by the ESE Education Committee to undertake this task comprised Jens Bollerslev (Norway), Michal Krsek (Czech Republic), Karim Meeran (UK), and Misa Pfeifer (Slovenia).

The UEMS European Training Requirement was collated by the Standing Committee on Education and Professional Development of the Section and Board of Endocrinology comprising Maeve Durkan (Ireland), Anton Luger (Austria), Hans Perrild (Denmark), Richard Quinton (UK), and Graham Roberts (Ireland), based on the information on postgraduate training in endocrinology provided by the national delegates. This UEMS ETR was approved and ratified by the UEMS Council, all Specialty Sections and all National Medical Associations in 2018.

The constant development of specialist training and advances in clinical practice dictate the need for a periodical review of the curriculum and the ETR to ensure that they are consistent with current practice and fit for purpose. In 2023, the ESE and the UEMS Section and Board of Endocrinology agreed to develop common recommendations for a curriculum for postgraduate training in Endocrinology and to establish and update the European Training Recommendations.

The purpose of this Curriculum/ETR was to provide updated recommendations concerning the process and areas of knowledge and training in Endocrinology, as well as to list the different competencies and skills needed by a medical specialist in Endocrinology.

The updated ESE Curriculum and European Training Recommendations, the result of a collaboration between ESE and UEMS SBE in 2023, have been published in the European Journal of Endocrinology in 2024 and can be viewed at

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The authors responsible for the submission of this European Training Requirement to the UEMS ETR Review Committee in 2026 to the UEMS ETR Review Committee include:

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This submission has been reviewed and endorsed by the members of the UEMS Section and Board of Endocrinology National Association representatives.

Relevant references and publications were updated. Finally, six Entrustable Professional Activities applicable in endocrine training as guidance for those countries/institutions who voluntarily wish to utilise such tools in endocrine postgraduate training and assessment are included in Appendix 1.

The EBEEDM exam, which has been developed jointly with the European Society of Endocrinology, is based on the published updated curriculum of 2024.

The EBEEDM exam aims to assess the knowledge base of endocrinology trainees and the application of such knowledge to manage different clinical scenarios. At present the examination alone does not assess clinical competencies and therefore cannot be regarded as an exit examination, unless aligned with an established completion of a national accredited training program.

# II. TRAINING REQUIREMENTS FOR TRAINEES

## Trainees in Endocrinology, Diabetes and Metabolism

The training of the Clinical Endocrinologists in Europe should involve the principles, the practice and ethical aspects of the following:

- Foundation or core training in general internal medicine
- Higher training in core areas of Endocrinology, including diabetes, metabolism, nutrition, andrology, reproductive and sexual medicine
- Multidisciplinary training in a number of areas where the trainee should have responsibility for the care of patients
- Relevant research, or competence and ability to review and interpret relevant research, as well as clinical laboratory experience

### Content and Duration of Training

Endocrinology has evolved as a specialty to include numerous subspecialties, all having important contributions to various areas of Internal medicine. The traditional role of a medical specialist included assessment and evaluation, appropriate investigation in that target area and recommendation of appropriate diagnostic, therapeutic and interventional procedures. The practice of Endocrinology has changed towards more holistic competencies in the ambulatory setting, in intensive care medicine, in emergency medicine, in surgical and procedural care, as well as in the inpatient-hospital setting. Thus, appropriate training requires a broad base training in Internal Medicine.

The process of training, attaining defined competencies and applying them safely and efficiently in clinical practice requires time. Specialist training should start after 1-3 years of supervised hospital clinical practice, mainly in General Internal Medicine. The minimum total duration of such training before accreditation as a specialist should be 6 years full-time (or recognised equivalent) in a combination of General Internal Medicine (1-3 years) and Endocrinology (3-5 years).

### The Common Trunk

The training should start with 1-3 years full-time period of practical clinical experience (Foundation and/or Core) in General Internal Medicine and major medical disciplines in nationally approved centres. Since this trunk will be common with other medical specialties, high priority should be given to definition of the requirement and duration of the Common Trunk (as iterated in the UEMS ETR Internal Medicine Document, see here).

### Specialist Training in Endocrinology

This involves further 3-5 years of specialist training in Endocrinology, inclusive of Diabetes, Nutrition, Andrology, Reproductive and Sexual Medicine, as well as knowledge in Laboratory and Diagnostic Techniques in Endocrinology. This time should include the equivalent of 2 years full-time in Endocrinology as defined in section 6. The remaining 1-3 years can either be spent at a department/institution of endocrinology or used to acquire further experience in relevant medical disciplines and other clinical, laboratory and research activities.

Specialist training is competence-based and not number- or count-based. Endocrine societies of member states may define minimum average numbers required for imparting and internalizing clinical skills at a recommended competence level in the specific local/national training setting. Training may include a variety of training activities including procedures, clinics, ward rounds, multidisciplinary meetings, clinical research, attendance of training courses, and medical simulation training, as well as clinical and research exchange programmes. Training activities are not uniform throughout Europe and depend on the national structures and processes. However, the common goal of specialist training should be the development of professional competency in the domains and competencies as described below. Trainers should accompany trainees, monitoring and ensuring, by means of continuous assessment, the gradual attainment of sufficient competence that would allow them to entrust activities to trainees.

### Foundation or Core Training in General Internal Medicine

It is of great importance that training involves adequate experience in General Internal Medicine. This must be in the capacity of a practitioner working in a hospital, with an accepted postgraduate training programme, where the trainee should have responsibility for the care of patients with a wide variety of medical disorders. Further

details regarding the training in the specialty of Internal Medicine defined in the UEMS ETR on Internal Medicine can be accessed here. It may also usefully include shorter periods of practice in other disciplines such as Paediatrics, Obstetrics and Gynaecology, Laboratory Medicine, Nuclear Medicine and Radiology.

**Core Training in Endocrinology**

The Endocrinology training should be based on:

- A defined Curriculum and assessment of acquired knowledge, skills and competances. This should also include:
    - Reference to published guidelines, for example from EASD, ESE, ETA, ADA, Endocrine Society, ATA, EASO, ENETS, ESC
    - Reference to reliable educational materials relating to each expected area of knowledge and training in Endocrinology, including ESE On Demand content, ESE Postgraduate Course lectures, scientific articles published in high-impact endocrine journals and textbooks of endocrinology
- Defined competencies
- Defined accredited national centers
- A variety of training activities, including fellowships and exchange visits to national and international expert centers
- Assessment should be linked to, specialty knowledge, outcome and overall professional development

Training in Core areas of Endocrinology should involve:

***Physiology and function of the endocrine system***

A thorough modern grounding in the normal function of the endocrine system, including the physiology and biochemistry of hormones and their actions, and reflecting advances in molecular medicine.

***Endocrinology***

Extensive first-hand practical experience, in a recognised training centre, of the management of diseases primarily involving the endocrine system.

***Diabetes mellitus***

Extensive practical experience in all aspects of diabetes mellitus and its complications.

***Metabolism and Nutrition***

Extensive first-hand practical experience on clinical nutrition in healthy individuals, as well as on metabolic and nutritional disorders including lipid disorders, obesity, malnutrition, inborn errors of metabolism, eating disorders, enteral and parenteral nutrition.

***Andrology, Reproductive and Sexual Medicine***

Extensive experience with gonadal dysfunction, reproductive disorders (including infertility and sexual dysfunction), as well as menopause, contraception, disorders of sexual development and gender dysphoria.

***Laboratory Endocrinology***

An understanding of the principles and practice of hormone assay methods, the use of diagnostic tests, as well as molecular genetic testing is essential. Training should therefore include exposure to endocrine and genetic laboratory services.

***Diagnostic techniques in Endocrinology***

Extensive experience in the interpretation of the results, usefulness and limitations of ultrasound, CT, MRI, scintigraphy, PET, angiographic techniques with venous sampling (e.g., inferior petrosal sinus sampling for ACTH and adrenal vein sampling), is critical for a trainee in Endocrinology. The adoption of a multidisciplinary approach to applicaiton and interpretation of different imaging modaliites and results, involving radiologists, interventionalists and neuroradiologists is essential. The trainee may acquire competence and aspire to perfom autonomously some of these, namely thyroid ultrasound with fine needle aspiration, a technique becoming more often perfomed by Endocrinologists in some European countries. Appropriate referral and Liasion with medical geneticists in patients recognised to potentially benefit from genetic work up, counselling and subsequently cascade testing of at risk relatives is similarly crucial as medical practice embraces a prescision medicine appraoch.

***Multidisciplinary Training***

This is important and mandatory, because Endocrinologists typically function at the centre of a network of other medical specialists and allied health professionals.

***Research Experience***

Training should preferably include direct involvement in scientific research into one or more of the subject areas outlined below. It is acknowledged that it is difficult to produce high quality research in these shorter time frames, and so equal emphasis is expected in appreciation and interpretation of research methodologies, publications, statistical analysis, critical appraisal and extensive reading of the literature.

## Requested Knowledge and Experience in Endocrinology

The domains below aim to provide an overview of the requested areas of knowledge, experience and training in Endocrinology; it is not intended to provide specific details of disorders or their treatment. The trainee should aim to demonstrate knowledge and understanding of the physiology, epidemiology and pathology, appropriate patient consultation, diagnostic techniques, treatment options and follow-up procedures for each of the disorders listed below. This represents the minimum expected criteria that may be deemed necessary to be covered by national training programmes in Endocrinology; however, diagnostic tools and treatments may vary depending on local availability or regulations, and thus should be defined locally.

## A. Diabetes mellitus

A.1. Type 1 diabetes
- A.1.1. Latent autoimmune diabetes in adults (LADA)

A.2. Type 2 diabetes

A.3. Other specific types of diabetes including
- A.3.1. Monogenic diabetes syndrome
- A.3.2. Diseases of the exocrine pancreas
- A.3.3. Drug- or chemical-induced diabetes

A.4. Gestational diabetes

A.5. Pre-diabetes

A.6. Diabetic emergencies
- 1.6.1. Diabetic ketoacidosis
- 1.6.2. Hyperosmolar hyperglycaemic state
- 1.6.3. Hypoglycaemia

A.7. Management of patients with diabetes during acute illness or surgery

A.8. Conception and pregnancy in diabetes

A.9. Complications of diabetes
- A.9.1. Screening for the complications of diabetes
- A.9.2. Cardiovascular macrovascular complications
- A.9.3. Eye disease
- A.9.4. Renal disease and hypertension
- A.9.5. Neuropathy and erectile dysfunction
- A.9.6. Autonomic neurological complications
- A.9.7. Diabetic foot
- A.9.8. Dyslipidaemia and atherogenesis
- A.9.9. Hypoglycaemia unawareness

A.10. Nutrition and metabolic support

A.11. Physical exercise as therapy for diabetes

A.12. Diabetes technology
- A.12.1. Insulin pumps
- A.12.2. Continuous glucose monitoring
- A.12.3. Closed loop systems

A.13. Diabetes and driving

## B. Lipid disorders

B.1. Advanced lipoprotein testing

B.2. Genetic lipid disorders

B.3. Lipodystrophy syndromes

B.4. Secondary dyslipidaemia

## C. Obesity and Nutrition

C.1. Etiology and pathogenesis of obesity

C.2. Clinical presentation and complications of obesity

C.3. Treatment of obesity
- C.3.1. Diet and psychobehavioral approach

C.3.2. Physical Exercise
C.3.3. Pharmacotherapy
C.3.4. Bariatric surgery
C.4. Physiology of nutrition, and assessment of the nutritional status
C.5. Inborn errors of metabolism
C.6. Eating disorders
C.6.1. Anorexia nervosa
C.6.2. Bulimia nervosa
C.7. Nutrition in healthy individuals and in patients with metabolic diseases
C.8. Enteral and parental nutrition

## D. Pituitary and Neuroendocrinology

D.1. Pituitary tumours and hyperfunction of pituitary gland
D.1.1. Prolactinoma and hyperprolactinaemia
D.1.2. Acromegaly and gigantism
D.1.3. Cushing's syndrome
D.1.3.1. Cushing's disease
D.1.3.1.1. Nelson's syndrome
D.1.3.2. Ectopic ACTH syndrome
D.1.3.3. Pseudo-Cushing's syndrome
D.1.3.4. Iatrogenic Cushing's syndrome
D.1.4. Thyrotrophinoma
D.1.5. Gonadotrophinoma
D.1.6. Non-functioning pituitary tumours
D.1.7. Pituitary incidentalomas
D.1.8. Aggressive or metastatic pituitary tumours
D.1.9. Genetics and inherited forms of pituitary tumours
D.1.10. Syndrome of inappropriate antidiuresis (SIAD)
D.2. Hypopituitarism
D.2.1. Anterior pituitary deficiency
D.2.2. Posterior pituitary deficiency
D.2.3. Hypothalamic dysfunction
D.2.4. Pituitary dysfunction in systemic disorders
D.2.5. Drug-induced hypopituitarism
D2.6 Traumatic brain injury-induced hypopituitarism
D.3. Craniopharyngioma
D.4. Rathke's cleft cyst
D.5. Empty sella syndrome
D.6. Pituitary apoplexy
D.7. Infiltrative pituitary disorders
D.8. Non-pituitary sellar masses
D.9. Pituitary disorders during pregnancy

## E. Thyroid

E.1. Primary Hyperthyroidism

E.1.1. Graves-Basedow
E.1.1.1. Graves' orbitopathy
E.1.2. Toxic adenoma
E.1.3. Toxic multinodular goitre
E.1.4. Subclinical hyperthyroidism
E.1.5. Other causes
E.1.5.1. Hyperthyroidism factitia
E.1.5.2. Amiodarone-induced thyrotoxicosis
E.1.5.3. Ectopic thyroid tissue
E.1.5.4. Iodine excess
E.2. Primary Hypothyroidism
E.2.1. Autoimmune hypothyroidism
E.2.2. Iatrogenic hypothyroidism
E.2.3.1. Thyroidectomy
E.2.3.2. Radioactive iodine therapy
E.2.3.3. External radiotherapy
E.2.3.4. Hypothyroidism due to medications or exogenous substances
E.2.3. Subclinical hypothyroidism
E.2.4. Congenital hypothyroidism
E.2.5. Iodine deficiency
E.3. Thyroid emergencies
E.3.1. Thyroid crisis or storm
E.3.2. Myxoedema coma
E.4. Thyroiditis
E.4.1. Subacute thyroiditis
E.4.2. Autoimmune thyroiditis
E.4.3. Riedel's thyroiditis
E.4.4. Acute bacterial thyroiditis
E.4.5. Postpartum thyroiditis
E.5. Thyroid neoplasms
E.5.1. Benign lesions
E.5.1.1. Thyroid follicular nodular disease
E.5.1.2. Follicular thyroid adenoma
E.5.1.3. Oncocytic adenoma
E.5.2. Low-risk neoplasms
E.5.2.1. NIFTP (Non-invasive follicular thyroid neoplasm with papillary-like nuclear features)
E.5.2.2. Thyroid tumours of uncertain malignant potential
E.5.2.3. Hyalinizing trabecular thyroid tumour
E.5.3. Malignant thyroid neoplasms
E.5.3.1. Follicular thyroid carcinoma
E.5.3.2. Invasive encapsulated follicular variant papillary thyroid carcinoma
E.5.3.3. Papillary thyroid carcinoma
E.5.3.4. Oncocytic carcinoma of the thyroid
E.5.3.5. Differentiated high-grade thyroid carcinoma
E.5.3.6. Poorly differentiated thyroid carcinoma

E.5.3.7. Anaplastic thyroid carcinoma
E.5.4. Thyroid C-cell-derived carcinoma
E.5.4.1. Medullary thyroid carcinoma
E.6. Thyroid hormone resistance
E.7. Non-thyroidal illness syndrome
E.8. Thyroid disease in pregnancy
E.9. Iodine related disorders

## F. Parathyroid, calcium and bone

F.1. Hyperparathyroidism and other disorders of parathyroid gland
F.1.1. Primary hyperparathyroidism
F.1.2. Familial hypocalciuric hypercalcemia
F.1.3. Secondary hyperparathyroidism
F.1.4. Tertiary hyperparathyroidism
F.1.5. Parathyroid carcinoma
F.1.6. Other inherited forms
F.2. Hypoparathyroidism
F.2.1. Idiopathic hypoparathyroidism
F.2.2. Post-surgical hypoparathyroidism
F.2.3. Pseudohypoparathyroidism
F.2.3.1. Pseudopseudohypoparathyroidism
F.2.4. Other inherited forms
F.3. Vitamin D deficiency
F.4. Osteoporosis
F.4.1. Postmenopausal osteoporosis
F.4.2. Osteoporosis in men
F.4.3. Secondary osteoporosis
F4.4. Pregnancy and lactation-induced osteoporosis
F.5. Measurement of bone mass, bone turnover and fracture risk assessment
F.5.1. Tools for fracture risk assessment
F.5.2. Biochemical markers of bone turnover
F.5.3. Dual-energy X-ray Absorptiometry and Trabecular bone score (TBS)
F.6. Bone and mineral disorders
F.6.1. Other causes of hypercalcaemia and hypocalcaemia
F.6.2. Hypophosphataemia
F.6.3. Rickets and osteomalacia
F.6.4. X-linked hyperphosphaturic hypophosphataemia
F.6.5. Hypophosphatasia
F.6.6. Osteogenesis imperfecta
F.6.7. Paget's disease of bone
F.6.8. Fibrous dysplasia
F.6.9. High bone mass disorders

## G. Adrenal

G.1. Primary adrenal insufficiency
G.1.1. Addison’s disease

G.1.2. Mineralocorticoid deficiency
G.1.3. Other causes of adrenal deficiency
G.2. Congenital adrenal hyperplasia
G.3. Adrenal tumours and hyperfunction of the adrenal gland
G.3.1. Adrenal incidentaloma
G.3.2. Nonfunctioning adrenal adenoma
G.3.3. Primary aldosteronism
G.3.3.1. Aldosterone-producing adenoma
G.3.3.2. Bilateral adrenal hyperplasia
G.3.3.3. Familial forms of primary aldosteronism
G.3.4. Adrenal Cushing's syndrome
G.3.4.1. Cortisol-producing adenoma (with overt Cushing's syndrome)
G.3.4.2. Mild autonomous cortisol secretion (MACS)
G.3.4.3. Bilateral adrenal hyperplasia (including micronodular and macronodular hyperplasia)
G.3.4.4. Cortisol-producing adrenocortical carcinoma
G.3.5. Adrenocortical carcinoma
G.3.6. Phaeochromocytoma and paraganglioma
G.4. Pseudohyperaldosteronism
G.5. Adrenal hormone resistance syndromes

## H. Reproductive endocrinology, andrology and sexual function

H.1. Hypogonadotropic hypogonadism
H.1.1. Inherited
H.1.1.1. Kallman's syndrome and other genetic HH
H.1.2. AcquiredH.2. Growth and development
H.3. Puberty
H.3.1. Delayed puberty
H.3.2. Precocious puberty
H.4. Transition in Endocrinology
H.5. Polycystic ovary syndrome
H.6. Hirsutism
H.7. Hormonal contraception
H.8. Menopause
H.8.1. Early menopause
H.8.2. Ovarian hyperthecosis
H.8.3. Hormone replacement therapy
H.9. Primary ovarian failure
H.9.1. Turner's syndrome
H.10. Ovarian tumours
H.11. Testicular dysfunction
H.11.1. Klinefelter syndrome
H.11.2. Other chromosomal aberrations
H.11.3. Sertoli cell only syndrome
H.11.4. Cryptorchidism
H.11.5. Anorchia
H.12. Testicular tumours

H.13. Erectile dysfunction
H.14. Gynaecomastia
H.15. Management of the infertile couple
    H.15.1. Ovulation induction
    H.15.2. Induction of spermatogenesis
    H.15.3. Assisted reproduction
H.16. Disorders of sexual development
H.17. Transgender and gender diversity
H.18. Endocrine disorders in pregnancy
H.19. Peptide hormones, testosterone and anabolic steroids abuse to enhance physical performance

## I. Electrolytes and fluid balance

I.1. Hyponatremia
    I.1.1. Syndrome of inappropriate antidiuresis (SIAD)
    I.1.2. Other causes
I.2. Polyuria and polydipsia
I.3. Hypokalaemia
I.4. Hypomagnesaemia

## J. Neuroendocrine tumours

J.1. Thymus and mediastinal neuroendocrine tumours
J.2. Pulmonary neuroendocrine tumours
J.3. Gastroenteropancreatic neuroendocrine tumours

J.4. Functional neuroendocrine tumours
    J.4.1. Insulinoma
    J.4.2. Gastrinoma
    J.4.3. Glucagonoma
    J.4.4. Somatostatinoma
    J.4.5. VIPoma
    J.4.6. Ectopic ACTH syndrome
    J.547. Ectopic GHRH secretion
    J.4.8. Ectopic PTH-rP secretion and hypercalcemia
    J.4.9. Multiple/acquired hormonal secretion
J.5. Other neuroendocrine tumours
J.6. Carcinoid syndrome

## K. Inherited endocrine tumour syndromes

K.1. Multiple endocrine neoplasia (MEN)
    K.1.1. MEN1
    K.1.2. MEN2
    K.1.3. Other MEN variants
    K.1.4. Familial medullary thyroid cancer (FMTC)
K.2. von Hippel-Lindau disease

K.3. Familial paraganglioma syndromes
K.4. Carney complex
K.5. Familial isolated pituitary adenoma syndrome (FIPA)
K.6. Hyperparathyroidism-jaw tumour syndrome
K.7. Other syndromes: Neurofibromatosis type 1, Tuberous sclerosis, Cowden syndrome, Familial adenomatous polyposis, Lynch syndrome

### L. Autoimmune and other polyendocrine syndromes

L.1. Autoimmune polyglandular syndrome type 1
L.2. Autoimmune polyglandular syndrome types 2/3
L.3. IgG4-related disease
L.4. Immunodysregulation, Polyendocrinopathy, and Enteropathy X-linked (IPEX)

### M. Treatment-induced endocrine dysfunction

M.1. Amiodarone
M.2. Antiepileptics
M.3. Antidepressants and antipsychotics
M.4. Lithium
M.5. Corticosteroids
M.6. Opioids
M.7. Interferon
M.8. Immune checkpoint inhibitors
M.9. Tyrosine kinase inhibitors
M.10. Late effects in long-term cancer survivors
M.11. Misuse of endocrine treatments and hormone supplementation

### N. Endocrine-disrupting chemicals

N.1. Types of chemicals and sources of exposure
N.2. Modes of action and adverse endocrine effects
N.3. Special features of endocrine-disrupting chemicals

### O. Diagnostic techniques in endocrinology

O.1. Assessment of hormones and pitfalls of laboratory testing
O.2. Dynamic endocrine function testing
O.3. Conventional Imaging
    O.3.1. Ultrasound
        O.3.1.1. Thyroid ultrasound including fine needle aspiration
    O.3.2. CT
    O.3.3. MRI
O.4. Functional imaging
O.5. PET/CT and PET MRI
O.6. Angiographic techniques and localisation with venous sampling
    O.6.1. Bilateral inferior petrosal sinus sampling for ACTH
    O.6.2. Adrenal venous sampling for aldosterone
    O.6.4. Parathyroid venous sampling

O.7. Molecular genetic testing

## Domains and competencies in the ETR

**Definition of domains**
To fulfil the professional roles of a specialist in Endocrinology, the syllabus and list of domains as outlined in the Curriculum provides a comprehensive guide of content of endocrinology training programs.

**Broad Learning objectives**
Training includes acquisition of knowledge and expertise in all relevant domains, including those in the context of acute and no-acute patient care, critical illness and trauma. For each domain, learning objectives are divided into "knowledge, skills and attitudes" that are deemed necessary to achieve the required level of competencies:

**A**: observer level (has knowledge of, describes)
- **B**: performs, manages, demonstrates under direct supervision
- **C**: performs, manages, demonstrates under distant supervision
- **D**: trainee can be reliably trusted to carry out the procedure or task independently

The concept of competency therefore implies possessing the knowledge, skills and professionalism to deliver state of the art patient-centred care. Trainees need to be assessed in these domains for a defined and specific set of core skills and behaviours in order to ensure appropriate tackling of a given task when delivering endocrine care.

In the medical field the CanMEDS Framework (8) provides robust guidance for the provision and assessment of competency based medical education (9). It is a physician competency framework that describes the abilities, skills and attitudes of physicians required to effectively meet health care needs and groups them thematically under seven roles. The role as medical expert is essential and central to the framework. It is linked to the roles of communicator, collaborator, leader, health advocate, scholar and professional. A competent physician seamlessly integrates the competencies of all seven roles. Therefore training and assessment need to ensure this holistic approach is incorporated.

### i. Theoretical knowledge

Knowledge as per definition needs to be achieved at a level of competence. Areas and domains to be covered are listed in the curriculum. Knowledge is assessed at key points throughout training generally by means of a written examination employing one of more of the following methods: MCQs – Single Best Answer Questions, Short answer Questions, Assignments or Case Studies

### ii. Clinical skills and competences

Clinical skills and competences mapped to the curriculum are acquired as well as assessed

1. formatively during the training programme on an individual basis by tutors to whom the trainee is assigned and who will assess trainee performance in terms of skills and attitudes in addition to knowledge or
2. summatively at key times throughout the training programme or a combination of both assessment modalities. Feedback is an essential part of the process.

Such assessments should be standardised, and recorded using a specifically designed rubric with documentation of progression from level A to D and appropriate feedback throughout the programme.

Therefore, program directors, co-ordinators, tutors and examiners need training in

1. The use of workplace-based assessment tools such as objective structured clinical examination (OSCE), mini-clinical evaluation exercise (mini-CEX), case-based discussion (CBD), direct observation of procedural skills (DOPS), multisource 360-degree feedback (MSF).
2. Reviewing trainee portfolios and giving feedback to trainees to enhance reflection and improvement

Establishment and implementation of Entrustable Professional Activities (EPAs) is recommended to facilitate holistic assessment of all seven roles defined in the CanMEDS Model. Trainees move from observing to doing under supervision and finally to being entrusted to carry out tasks independently. Close supervision by an experienced endocrinologist is core. Such clinical and educational supervisors will only sign off a trainee on a particular EPA in a particular section of endocrinology when satisfied the trainee has reached the necessary level. The whole process is overseen by the training programme co-ordinators and directors.

### iii. Non-technical skills. competences and professionalism

Non-technical skills and professionalism are at the heart of endocrinology training.

Trainees need to know of, understand and apply these non-technical skills in all aspects of their practice, specifically those related to communication, collaboration, leadership, health advocacy, scholarship and professionalism.

In effect a physician's overall ability to perform a specific task includes multiple key skills from the CanMEDS framework.

Specifically, in Endocrinology, the key aspects of the seven different roles include those outlined below. Incorporation of these principles and competences into

learning and assessment is recommended. To facilitate the task of institutions who wish to consider embracing this framework, 6 specific EPAs, as well a template of rubrics for assessment, are provided and elaborated in Appendix 1.

**Expert clinician**

All endocrinologists

- must commit to lifelong learning to ensure the provision of optimal state of the art, evidence-based care.
- must be familiar with device and medical technology
- should acquire all necessary competences enabling them to fulfil this expert role and function in the multidisciplinary settings in intensive care, emergency medicine, peri-surgical care and inpatient hospital management.

  It is understood that knowledge, skills and attitudes learnt during undergraduate years are a pre-requisite and requirement for endocrinology trainees. During training this basic knowledge must be refreshed and act as a foundation for training in endocrinology.
  Domains specific to endocrinology include endocrine system related anatomy, physiology, pharmacology, toxicology, biochemistry, biology, psychology, statistics, aetiology, pathophysiology, diagnosis and treatment according to international standards of specific critical conditions in all patient cohorts including transition patients, patients with disability, geriatric patients, perioperative patients after elective and emergency surgery, critically ill and trauma patients.

  The trainee in Endocrinology should have access to an up-to-date endocrine laboratory service, and learn about hormone assay methods and, if trained to do so, contribute to its management. The trainee should be exposed to dynamic endocrine tests, which are often performed in dedicated facilities and/or day care hospitals. Endocrinologists should also understand the basic concepts and methodologies, as well as the impact of the increasing-available tests the domains of molecular biology and genetics which are relevant for the clinical practice in Endocrinology.

  The domain of perioperative medicine comprises the continuum in patient care, starting before the operative procedure and lasting well into the postoperative period; it concerns all patient categories and comprises the following tasks, which practice should be evidence-based:
  - Preoperative evaluation and preparation of the patient, appropriate choice and relevant use of preoperative laboratory tests and all other complementary examinations/investigations, as well referral to interdisciplinary consultations when required
  - Preoperative discussion and information of the patients
  - MDT discussion with both anaesthetists, surgeons and oncologists, as best suited to the conditions of the patient and to the operative procedure (e.g. Phaeochromocytoma and paraganglioma, Cushing's syndrome, or neuroendocrine tumour resection)

- Knowledge and appropriate use of clinically-relevant devices (e.g. insulin pumps, continuous glucose monitoring devices)
- Safe and appropriate perioperative management of problems, incidents and complications (e.g. hyponatraemia, hyperglycaemia, thyroid storm, hypertensive crisis, carcinoid crisis)
- Appropriate selection of postoperative management and care, including transfer to other specialized structures such as ICU (e.g., post-pituitary surgery, post-surgery for a phaeochromocytoma, paraganglioma, Cushing's syndrome or neuroendocrine tumour)
- Management of specific endocrine-related conditions (e.g., diabetic ketoacidosis and hyperglycaemic hyperosmolar state, adrenal crisis, electrolyte disturbances, AVP deficiency, syndrome of inappropriate antidiuresis (SIAD), thyroid storm, pituitary apoplexy)
- Pre- and in-hospital resuscitation
- Acute and chronic glycaemia management (diabetes type 1, type 2 and other forms of diabetes)

**Communicator**

The specialist in Endocrinology should have competences in communication and in effective organization and task management. The main aspects are:

- Effective, open empathic and respectful communication with patients and family/relatives across the life course additionally focussing on the medical, cognitive, psychological, developmental and social needs specific to transition from paediatric to adolescent to young adult and adult care
- Effective and professional communication with colleagues, other collaborators regulators and service providers to ensure optimal patient care across the life course

Endocrinologists typically work at the centre of a network of other medical specialists and health professionals. Below, some of the key MDT areas:

- reproductive endocrinology and infertility (jointly with gynaecologists urologists, geneticists and genetic counsellers)
- growth disorders, Disorders of Sexual Differentiation (DSD), and precocious/delayed puberty (jointly with paediatric and adolescent endocrinologists, geneticists, gynaecologists, urologists, surgeons)
- neuroendocrinology and pituitary diseases (jointly with neurosurgeons, neuroradiologists, neuropathologists, geneticists, neuro-ophthalmologists, radiotherapists)
- adrenal, thyroid, or parathyroid diseases (jointly with endocrine surgeons, radiologists, pathologists, geneticists and nuclear medicine physicians)
- endocrine-related cancers, including thyroid cancer, adrenal cancer, neuroendocrine tumours (jointly with oncologists, surgeons, nuclear medicine physicians, radiologists, radiotherapists gastroenterologists, geneticists)

- diabetes and obesity (jointly with the dietitians, podiatrists, psychologists, endocrine nurses, bariatric surgeons, vascular surgeons, ophthalmology, dermatology, rheumatology as well as pediatric endocrininologists for those in transition)

**Leadership and Collaboration**

The competences required include:

a. Knowledge
   - Knowledge of administrative, medico-legal, ethical, and economic aspects of endocrinology practice

b. Skills
   - Ability to form part of a multidisciplinary and inter-professional team working in acute care (operating theatre, intensive care unit, emergency room, labour wards), as well as in the context of protocol implementation
   - Effective communication in the setting of MDT in the resolution of conflicts, decision-making skills, giving feedback, taking and assuming leadership
   - Implementation and use of quality assurance programs according to recognized national and international standards
   - Implementation and use of local, national and international practice guidelines and standards
   - Cost-effective and relevant use of diagnostic, prophylactic and therapeutic means and measures (health economics)

C Attitudes

- Promotion, participation and ensuring better and safer patient care in an equitable manner

**Scholar**

The specialist in Endocrinology should develop and maintain a high degree of professional competence, to facilitate development of colleagues and other professionals, and to promote development of the specialty.

Different aspects comprise:

- Life-long learning and reflective thinking; critical reading and appraisal of updated information relevant to clinical Endocrinology as well as inpatient and ambulatory medicine
- Acquisition of basic tools for teaching (including supervision), skills for research and education presentations, teaching of young colleagues, residents and allied healthcare professionals
- Contribution to research, development, and implementation/ transmission of new medical knowledge as well as auditing
- Contribution to education of patients, students and healthcare professionals

### a. Knowledge

Trainees

- will understand the scientific approach to analysis and solving questions worthy of scientific investigation
- Will know how to search for information and carry out a literature review
- Can formulate a hypothesis, know about research design, bias and appropriate methods of measurement; data collection and storage; good record keeping
- Know how to carry out common statistical tests and application of statistics relevant to the project; Interpretation of results
- Know and adhere to the content of the Declaration of Helsinki and ICH (International Council for Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use) Guideline for Good Clinical Practice (GCP)
- Will know how to monitor studies and perform post study surveillance
- Will know about copyright and intellectual property
- Will appreciate the responsibilities of Institutional Review Board/independent ethics committee, and of investigator to the ethics committee; will know ethical principles
- Will know the principles of writing a scientific paper, and of doing an oral or poster presentation of a paper/study
- Will know the principles of evidence-based medicine (including levels of evidence)
- Will know the process of obtaining funding and writing a basic grant application

### b. Evidence based practice skills

Trainees will have the following skills

- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Applying the principles of evidence-based medicine to clinical practice
- Carrying out oral presentations and professional communication
- Presenting quality assurance exercises or projects
- Developing facilitation skills, such as tutoring in small-group learning and conducting small-group meetings

### c. Specific attitudes

Trainees will

- Value educational and scientific processes
- Distinguish between practice with a sound scientific basis and that which requires further objective assessment
- Commit to informed consent, confidentiality and all other ethical principles of research
- Critically appraise their own limitations, abilities and areas of expertise
- Commit to lifelong continuing professional development

**Professionalism:**
The specialist in Endocrinology will exhibit irreproachable behaviour and be aware of duties and responsibilities inherent to his/her role as a professional:

● Provision of high-quality care with empathy, integrity, honesty and compassion
● Recognition of personal limits and abilities, and appropriate consultation with/or delegation to others when caring for the patient
● Medical decision-making based on thorough consideration of ethical aspects in patient care, management of ethical conflicts

### a. Knowledge

- Principles of medical ethics: autonomy, beneficence, non-maleficence, and justice
- The Geneva Declaration and Helsinki protocol
- Legal principles and medico-legal obligations defining medical practice and the use of patient data
- Governmental regulations relevant for endocrinology practice
- Principles of communication with patients including:
    - Rights and responsibilities of patients, doctors and other medical staff
    - Informed consent
    - Patient confidentiality and privacy
    - Error and incidents disclosure
- Principles of communication with colleagues including:
    - Methods (verbal, written, consultation or referral)
    - Manner (courtesy, integrity, respect)
    - Adequate record keeping (including medico-legal implications)
- Personal issues including:
    - Balancing family and work, and the importance of non-professional activities
    - Depression; recognition and care plans
    - Substance abuse; recognition and access to appropriate referral
    - Mentoring and teaching
- Leadership responsibilities and styles; team behaviours
- Stress and crisis management
- Principles underpinning conflict resolution
- Principles of role model
- Principles of teaching and patient empowerment

### b. in the clinical setting

- Applying principles of medical ethics
- Attaining attributes in the 7 roles of a specialist in Endocrinology
- Applying the principles of evidence-based medicine to clinical practice

- Use of information technology to optimize clinical care, including literature searches
- Basic appraising journal articles including the interpretation of study design, statistics, results, and conclusions
- Awareness of medico-legal obligations related to medical practice
- Commitment to the main ethical principles and professional values, such as altruism, fidelity, social justice, honour, integrity, and accountability
- Commitment to the rights of patients to autonomy, confidentiality, informed consent, comprehension of the risks of medical techniques (patient-centeredness) irrespectively of race, culture, gender, sexual orientation, and socio-economic status

### c. Specific attitudes

- Commitment to lifelong continuing professional development and education, refreshment of competencies in reflective learning, and maintaining an inquisitive attitude.

## Health advocacy, patient safety and health economics

### a. Knowledge

- Recommendations of quality of care and patient safety from national, European and international authorities
- Fundamentals in patient safety including:
    - Human limitations
    - Stress, fatigue, decision making, fixation errors, prospective memory
    - The role of the teams, hierarchy
    - Safety culture, principles of High Reliability Organizations (HROs), the five common principles of HROs:
        - Preoccupation with failure
        - Reluctance to simplify interpretation
        - Sensitivity to operations
        - Commitment to resilience
        - Deference to expertise
- Tools for quality assurance and error management:
    - Analysing the problem:
        - Reporting systems
        - Critical incident monitoring
        - Different methods of event-analysis
        - Root-cause analysis
    - Tackling the problem:
        - Main topics in safety problems
        - Medication error (prescribing: wrong drug, wrong dose)
        - Wrong side/site procedures

        - Hospital acquired infections
        - Patient-handover
        - Open disclosure communication
- Economic aspects:
    - Demographic data and resource utilization data relevant for endocrinology practice,
    - Basic knowledge on financial aspects of endocrinology practice
    - Basic knowledge on organizational and budgeting aspects of endocrinology practice (Principles of business management)

### b. Clinical skills

- Application of standards of quality of care and patient safety in daily practice
- Use of checklists and guidelines
- Risk management
- Providing data for both local and national data systems
- Considering cost-effectiveness

### c. Specific attitudes

- Commitment to critical incidents reporting and risk management
- Patient physician support in the event of adverse events

## Organisation of Training

For each trainee there should be a structured programme supervised by a trainer. The ideal trainer:trainee ratio is 1:1. Training should be carried out in accredited and recognised institutions which ensure the provision of all the necessary resources (human, structural, infrastructural and financial) to support training

All the steps in the training programme should be properly documented in a structured portfolio.

**Portfolio**
In the portfolio, the trainee keeps a record of all the activities and perspectives related to their development.

Data are collected from:
**Learning experiences** depicting the learning achievements of the trainee:
- Logbook summarizing clinical experience, including diagnoses and treatments
- Courses
- Academic experience, scholarly work, presentations, scientific articles
- Personal development plan, with regular updates of progress in training, reflective reports and reports of discussions with the tutor

**Supervision:**
Supervision of Trainees requires continuing supervision of their clinical duties. In addition, supervision of their training program and schedule is required to ensure they are making sufficient progress, that milestones are being achieved and that the training curriculum is being covered. Thus, the trainee needs both Clinical and Educational Supervision. One supervisor may undertake both roles, or the roles may be undertaken by separate individuals depending on local arrangements. It is advisable, however, that if there is a separate Educational Supervisor, they should be a clinician in the specialty team and not be remote from the clinical environment where the trainee works.

A Clinical Supervisor may be responsible ideally for only one trainee, and the Educational Supervisor ideally should supervise no more than three trainees.
A Clinical Supervisor oversees the trainee's ongoing work and provides constructive feedback. Although all elements of work in training posts must be supervised, as training progresses, the trainee should have the opportunity for increasing autonomy, consistent with safe and effective patient care.
An Educational Supervisor oversees the trainee's educational progress in the context of the specialty curriculum. They review the trainee's logbook or e-logbook, set goals and provides direction and advice on a regular basis. Educational Supervisors should be familiar with the use of assessment tools, how to support trainees in difficulty and how to give effective feedback including goal setting and career advice. Ideally, Educational Supervisors should have attended a 'Train the Trainers' course.

## Assessment and Appraisal of Training

Educational Supervisors should have an induction session with their trainees soon after enrolment, during which the training programme and curriculum are explained and the means by which the various clinical aspects of training can be completed. In addition, each trainee should, on a yearly basis, discuss and document a detailed training plan for the forthcoming year with their Educational Supervisor.

In the first year of specialized Endocrinology training, after common trunk of General Medicine training, the trainee will require frequent formal feedback from Clinical and/or Educational Supervisor up to 2-3 times.

Established assessment tools for appraisal of clinical knowledge, skills and professional attributes should be used on an ongoing basis during training, and documentation of these appraisals should be maintained in the trainee's logbook. The assessment of clinical skills, especially problem-oriented history taking, physical examination, diagnostic decision-making ability, appropriate selection of investigations, investigation interpretation and clinical judgement, is particularly important. Different workplace assessment instruments may be used in various countries or institutions to document these skills. Workplace assessment of trainee's behaviour and professionalism is normally carried out by patient surveys and feedback from colleagues and other members of the relevant MDT. Assessment of procedural

skills need to be documented by the trainee in conjunction with the trainer. This is normally performed by direct observation of the trainee's procedural skills.

Appraisal of training progression should be performed formally on a yearly basis jointly by the trainee and Educational Supervisor by reviewing the trainee's logbook and confirming evidence of the attainment of competencies in knowledge, clinical skills and professional attributes and discussing other matters of relevance to completion of training. The appraisal of training before entering into the final year of training is particularly important as deficits in training can be identified and plans for correction made; for this reason, it is advisable that this particular appraisal involves an external assessor as well as the usual Educational Supervisor.

## Governance of Training

The governance of an individual's training programme is the responsibility of the Programme Director and the institution(s) in which the training programme is being delivered.

The Director of Training should have at least 5 years of experience post specialist accreditation. They must have a sound practical knowledge of the broad field of endocrinology and must be recognised by the national authority. They should have the necessary educational, organizational and leadership qualities and have considerable knowledge and expertise in postgraduate training. Attendance at Training the Trainers Courses is strongly recommended and should be mandatory. The Programme director should schedule meetings with both trainers and trainees at given time points to ensure that training, assessment and mentoring is in hand. Feedback from trainees regarding the training programme, facilities provided, and mentors should be solicited, analysed and actions formulated and imparted to staff and trainees.

## III. Training Requirements for Trainers

### a. Requested Qualifications and Experience

Trainers will be responsible to the Programme Director for delivering the required training in their area of practice. Training recommendations for trainers and a process for recognition as a trainer in all training institutions is crucial. Trainers will be expected to have achieved the appropriate nationally recognized qualification to allow them to practise as a specialist in Endocrinology and should have at least three years' experience as practising endocrinologists.
Likewise, the medical staff acting as clinical and educational supervisors should be actively practising endocrinologists and be committed to residency training

### b. Core competencies for trainers

Special Qualifications of the trainers (if not covered by EU Directive on Professional Qualifications) should include but not be limited to the following*:*

1) Know all aspects of the overall endocrinology curriculum and the problems related to its clinical implementation
2) Have experience in teaching theoretical aspects of endocrinological diseases and acquisition of skills in procedures
3) Be familiar with modern medical education principles, including the appropriate use of standard assessment tools, provision of constructive formative feedback and receive regular updates in leadership and mentorship
4) Understand the needs of the trainee to achieve the goals of the training programme and help them to progress throughout the training period with promotion of competencies and scientific thought.
5) Develop their own leadership and mentorship competencies

**c. Quality Management**

Quality management for trainers should show itself to be committed to specialist education and provide appropriate time, space, facilities and funding to protect the needs of education from the demands of service.

The members of the faculty should be experienced endocrinologists and teachers, committing time, effort and enthusiasm to the training programme. They should regularly attend interdisciplinary meetings with surgeons, pathologists and radiologists as well as other health care professionals. The faculty should be large enough to supervise the clinical and practical work of the trainees.

## IV. Training requirements for training centers

Training recommendations for training institutions and the process for recognition as a Training Centre in Endocrinology should be based in a University department, a University affiliated institution or in those with an equivalent educational, and/or research programme.

**1.Requirement on staff and clinical activities**

The Training Centre should be located in a Hospital or Institution, which also has surgical, intensive care, radiology and access to histopathology, biochemistry, and microbiology and haematology laboratory facilities. The Hospital/Institution should also have a broad array of endocrinology services as well as other medical specialty services such as cardiology, pneumonology, gastroenterology, hepatology, haematology, nephrology, infectious disease, rheumatology, obstetrics and gynaecology, dermatologists and dermatovenerologists, neurologists, medical genetics and oncology. The balance between service provision and training needs to be safeguarded.

**2.Requirement on Equipment, Accomodation**

The Training Centre should be housed in quality buildings, and must have facilities for inpatients and outpatients as well as a Diabetes Unit and an Endocrine Clinical Investigation room/laboratory.

Satisfactory premises for education are needed with teaching space, library, and contemporary information technology and audio-visual teaching aids.
Quiet spaces dedicated to trainee well-being, reflection and rest should be available.
Physical space for research purposes is also recommended.
Administrative support is essential.
Access to and support in the use of information technology required for research, use of healthcare information systems, patient data, electronic or distance learning resources should be provided

Rotation-Training Centres and Single Affiliated/Accredited Training Centres must be recognised by their national authorities to be of such quality and to provide sufficient training for the specialty of endocrinology. Some units, with high quality endocrine clinical facilities and training, may lack the full complement of training facilities and opportunities. These units may be recognised as a Rotation-Training Centre of sufficient merit such that an endocrine trainee will receive sufficient training for a period of 1-2 years. A trainee may therefore fulfil the training by rotating between a number of recognised training centres.

3. **Quality management within training institutions**

Currently across Europe it is the remit of the national authorities and institutions that determines recognition and or accreditation as training hospitals or institutions. Accreditation should be reviewed after a maximum period of 5 years with a self-evaluation report being compiled and submitted by the departments/institutions. Appraisers should be granted access to the self-evaluation report, internal documentation, annual reports and results of internal audits committee minutes and recommendations, staffing and trainee ratios, assessments, outcomes and interviews with all stakeholders. This helps to ensure adequacy and transparency of all processes in training institutions.

On a trans-European level, UEMS-CESMA, EACCME, UEMS-NASCE provide important resources and frameworks for quality assurance and improvement. Training institutions in different member countries are encouraged to refer to the Curriculum and the European Training Recommendations endorsed by all stakeholders listed at the start of this document. They are also assured of access to the above mentioned UEMS tools and expertise to ensure standards.

## Conclusions

UEMS Section and Board of Endocrinology and its members representing European national endocrine societies and medical associations have worked in collaboration with the European Society of Endocrinology and the ESE Council of Affiliated Societies to produce the curriculum and training recommendations published in EJE and referenced below (1).

Furthermore, a survey has been carried out to assess the state of endocrine training in Europe. The results of that survey were disseminated in a second publication in EJE (2). A further survey on the recognition and accreditation of training centres in Endocrinology was carried out in 2025 and has been accepted for publication in Endocrine Connections (3).

This ETR is a living document and regular review of both the Curriculum and the ETR in Endocrinology is recommended given the need to appreciate and react to patient needs, practice evidence-based endocrinology and ensure the highest standards of care. The aim of this document and all relevant surveys and publications is to further the principles of training and assessment in Endocrinology throughout Europe and beyond and to provide a framework for national societies and institutions to review and consider when setting up, running and analysing their training programmes and institutional accreditation**.**

Finally, the UEMS Section and Board of Endocrinology in collaboration with ESE has also established the European Board Examination in Diabetes, Endocrinology and Metabolism (EBEEDM– a single best answer MCQ (multiple choice question) examination aimed at assessing knowledge and application of knowledge using clinical scenarios. The exam is currently not an exit examination; additionally, national training programme assessment of clinical skills and competencies is essential to obtain specialist certification in Europe.

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# Appendix 1

## Entrustable Professional Activities in Endocrinology

## EPA 1 Planning Diagnostics and Treatment for Endocrinology Patients in a Clinical Setting

The goal of this EPA is to ensure the trainee can diagnose common endocrine diseases and plan follow-up tests and treatments during a clinical appointment.

Includes

- Interviewing and clinically examining the patient.
- Evaluation of any medication list or allergies to medication
- Interpreting the results of any past investigations of relevance to the current presentation
- Considering differential diagnoses.
- Planning and conducting investigations
- Creating a plan for further investigations and treatment in the community or on admission if necessary
- Communicating effectively with patients, guardians, relatives and colleagues in other departments given the multidisciplinary management required particularly given the multisystem impact of a number of endocrine conditions
- Following up on disease progression, reviewing of medications and medical interventions
- Imparting bad news when required
- Ensuring adherence to current guideline recommendations and standards of care

Key roles and competences to be assessed in this setting

- Medical Expert
- Communication
- Coordination of care and practice environment
- Collaboration
- Leadership
- Health Promotion
- Professionalism

Risk management

In the case of adverse events as a result of

- Inadequate documentation
- Incorrect diagnosis with delayed treatment and related adverse outcomes
- Failure in treatment scheduling, errors in treatment planning and errors
- Unnecessary tests

To appreciate and take the following steps:

- identification of causation,
- communicating with patient and family,
- remedial action to mitigate adverse effects
- prevention of recurrence

Performance expectations (Knowledge, skills and attitudes)

- Master the medical aspects of the disease sufficiently to identify the required tests, treatment and plan follow up
- Perform and document sufficient information (Past history, current presentation, medication lists and doses etc.) to enable correct diagnosis and management.
- Assess current condition and status and interpret clinical and laboratory/radiological/genetic findings to establish a diagnosis
- Plan additional tests if necessary
- Plan timing of next review
- Plan treatment
- Communicate the diagnosis, results, treatment and review options available for the patient and if necessary their family
- Ensure updated, clear patient records to ensure information transfer if continued care is required
- Collaborating with different healthcare professionals in different specialties to ensure optimal outcomes and standards of care
- Ensuring adherence to most recent guideline recommendations and standards of care

**Formative feedback**

- Observation of performance whilst on the job by clinical tutors/supervisors/educational supervisors
- Supported increasingly independent practice as indicated earlier at 4 levels
- Monitoring progression from level 1 to level 4
- Protected time for self-directed learning ensuring a balance between service provision and training
- Mentoring and support depending on trainee needs

**Assessment by means of**

- Case-based discussions
- Mini clinical examinations (Mini-CEX)
- Observed structured clinical examination (OSCE)
- Portfolio review, discussion and reflection on practice

Support and preparation for summative assessments at key times throughout training and on exit from training programmes

Feedback on knowledge, skills and attitudes with setting of next goals at key time points

## EPA 2 Emergency patient care

Management of patients in a hospital emergency unit.

Includes:

- Reviewing patient history considering the urgency of the situation.
- Assessing the patient's disease progression and noting any warning signs.
- Interviewing and clinically examining the patient.
- Evaluation the medication list
- Considering differential diagnoses.
- Conducting emergency investigations
- Determining the need for admission as an inpatient
- Creating a plan for further investigations and treatment in the community or on admission
- Liaising with colleagues in subspecialties where input about management is required
- Communicating effectively with patients, guardians, relatives and colleagues in other departments such as ICU, CCU given the multidisciplinary management required in endocrine emergencies
- Adhering to updated guidelines and standards of care

Key roles and competences to be assessed in this setting

- Medical Expert
- Communication
- Coordination of care and practice environment
- Collaboration
- Leadership
- Health Promotion
- Professionalism

Risk management

In the case of adverse events as a result of

- Inadequate documentation
- Incorrect diagnosis with delayed treatment and related adverse outcomes
- Failure in treatment scheduling, errors in treatment planning and errors
- Unnecessary tests

To appreciate and take the following steps:

- identification of causation,
- communicating with patient and family,
- remedial action to mitigate adverse effects
- prevention of recurrence

Performance expectations (Knowledge, skills and attitudes)

- Master the medical aspects of the disease sufficiently to identify the required tests, treatment and plan follow up
- Compile and document sufficient information (Past history, current presentation, medication lists and doses etc.) to enable correct diagnosis and management.
- Assess current condition and status and interpret clinical and laboratory/radiological/genetic findings to establish a diagnosis
- Plan additional tests if necessary
- Formulate a management plan in the Emergency department, on admission or discharge as the case may be
- Communicate the diagnosis, results, treatment and review options available for the patient and if necessary their family
- Ensure updated, clear patient records to ensure information transfer if continued care is required. Provision of case summary on discharge
- Collaborating with different healthcare professionals in different specialties to ensure optimal outcomes and standards of care
- Ensuring adherence to most recent guideline recommendations and standards of care

**Formative feedback**

- Observation of performance whilst on the job by clinical tutors/supervisors/educational supervisors
- Supported increasingly independent practice as indicated earlier at 4 levels
- Monitoring progression from level 1 to level 4
- Protected time for self-directed learning ensuring a balance between service provision and training
- Mentoring and support depending on trainee needs

**Assessment by means of**

- Case-based discussions
- Mini clinical examinations (Mini-CEX)
- Observed structured clinical examination (OSCE)
- Portfolio review, discussion and reflection on practice

Support and preparation for summative assessments at key times throughout training and on exit from training programmes
Feedback on knowledge, skills and attitudes with setting of next goals at key time points

## EPA3: In patient management (ward rounds and consultations)

Conducting medical rounds with the participation of various healthcare professionals in a multidisciplinary, interprofessional model of healthcare.

Includes

- preparation for the round in the case of ward rounds
- assessing current clinical findings, results of investigations and the patient's progress since admission
- considering differential diagnoses and reaching a diagnosis
- creating a plan for further investigations, treatment and eventual management in the community on discharge
- ensuring management is in line with most recent guidelines and standards of care
- acquiring skills and attitudes to be employed when on call or when reviewing requests for consultations from other departments.

The trainee must prioritize the urgency of patient care and investigations. Effective communication with both the healthcare team and the patient and their relatives is required.

The trainee must consider potential drug interactions, understand the importance of updating the medication list, and be able to create follow-up care instructions for discharge or transfer to further care.

The trainee must ensure appropriate documentation of their findings, recommendations and treatment planned.

The same process as outlined above for EPA1 and involving

Knowledge, skills and attitudes
Risk management
Performance
Feedback
Assessment
Mentoring

Is applicable for this EPA

## EPA 4 Planning the Care and Follow-up of a Patient Requiring Multidisciplinary Collaboration

- The goal is to plan the care and follow-up of a patient requiring multidisciplinary collaboration during the consultation

  This is especially important in the setting of acute and chronic endocrine conditions requiring investigation, surgical intervention, chronic endocrine conditions with multisystem effects, endocrine malignancy, endocrine disorders in pregnancy.

  The trainee must consider potential drug interactions, understand the importance of updating the medication list, and be able to create follow-up care instructions for discharge or transfer to further care.

  The trainee must ensure appropriate documentation of their findings, recommendations and treatment planned.

Includes

- assessing current clinical findings, results of investigations and the patient's progress since admission/last review
- reviewing outcome of any consultations with other healthcare professionals particularly regarding disease progression or change in management
- Determining current level of morbidity and risk stratification
- Creating a plan for further investigations, treatment and eventual management in the community or after discharge
- Ensuring that all medical records and involved health care professionals have access to an updated patient file and treatment chart

The same process as outlined above and involving

Knowledge, skills and attitudes to be achieved
Risk management
Performance
Feedback
Assessment
Mentoring

is applicable for this EPA

## EPA5 Planning Diagnostics and Treatment for Patients with Diabetes in a Clinical Setting

- The goal is to plan the treatment and follow-up of the patient with diabetes and plan or start treatment with insulin pump during a clinical appointment
- Screening for complications of diabetes and liaising with other health care professionals critical to the management of this multisystem condition and its complications

This is especially important in the setting of newly diagnosed and established impaired fasting glucose, impaired glucose tolerance and diabetes.
The trainee must carry out regular review with

- History and systematic examination
- Assessment of key risk factors and
- Achievement of control of diabetes hypertension, hyperlipidaemia,
- Assessment of disease progression particularly the micro and macrovascular complications, skin manifestations and musculoskeletal problems,
- Carry out and review requisite investigations,
- Appropriate referral for surgical intervention, review by ophthalmology, podiatry, tissue viability services, vascular surgery, cardiology, neurology, nephrology, dermatology
- Recognise red flags and screen for endocrine malignancy
- Manage diabetes preconception, during pregnancy and post-partum
- Communicate with patients and encourage behavioural change
- Support patients particularly the elderly, frail patients, those with special needs and those with socioeconomic issues.

The trainee must consider potential drug interactions, understand the importance of updating the medication list, and be able to create follow-up care instructions till next review, discharge or transfer to further care.

The trainee must ensure appropriate documentation of their findings, recommendations and treatment planned

The same process as outlined above and involving

Knowledge, skills and attitudes to be achieved
Risk management
Performance
Feedback
Assessment
Mentoring
is applicable for this EPA

## EPA 6 Researching diagnostic dilemmas, best management options including in rare diseases, benefits and disavantages of different modalities

- The trainee should be capable of researching clinical dilemmas and management options.
- The trainee should be familiar with the use of reference resources and know how to frame a research question appropriately.
- The trainee should be able to establish an evidence base for decisions related to diagnosis and management
- Trainees should be trained to carry out audits of practice, formulate recommendations and subsequently close the loop by reauditing.

Training in scientific research methodology for clinical studies is essential in order for the development of critical appraisal skills and the ability to formulate and research a particular question.

Case based discussions particularly involving rare diseases provide an excellent tool to assess the above mentioned skills.

The same process as outlined above and involving

Knowledge, skills and attitudes to be achieved
Risk management
Performance
Feedback
Assessment
Mentoring

is applicable for this EPA