



**European Society of Endocrinology
Recommended Curriculum of
Specialisation in Clinical
Endocrinology, Diabetes
and Metabolism**

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Endorsement

The ESE Recommended Curriculum of Specialisation in Clinical Endocrinology, Diabetes and Metabolism is endorsed by the members of the ESE Council of Affiliated Societies:

Albanian Society of Endocrinology
Austrian Society for Endocrinology and Metabolism
Belarusian Association of Endocrinologists
Belarusian Public Medical Society "Endocrinology and Metabolism"
Belgian Endocrine Society
Bosnia and Herzegovina Society of Endocrinology and Diabetology
Bulgarian Society of Endocrinology
Croatian Society for Endocrinology
Croatian Society for Endocrinology and Diabetology
Croatian Society for Diabetes and Metabolic Disorders
Cyprus Endocrine Society
Czech Endocrine Society
Danish Endocrine Society
Egyptian Association of Endocrinology, Diabetes and Atherosclerosis
Egyptian Society of Endocrinology and Obesity
Estonian Endocrine Society
Finnish Endocrine Society
French Endocrine Society
Georgian Endocrinologists Society
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German Society for Endocrinology
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Italian Endocrine Society
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Latvian Association of Endocrinology
The Libyan Association for Diabetes and Endocrinology
Lithuanian Society for Endocrinology
Macedonian Endocrine Association
The Endocrinology Association of Montenegro
Netherlands Society for Endocrinology
Norwegian Society of Endocrinology
Polish Society of Endocrinology
Polish Society of Gynecological Endocrinology
Portuguese Society of Endocrinology, Diabetes and Metabolism
Association of Endocrinologists and Diabetologists of the Republic of Srpska
Romanian Psychoneuroendocrine Society
Romanian Society of Endocrinology
Russian Association of Endocrinologists
Serbian Endocrine Society
Slovak Endocrine Society
Slovenian Endocrine Society
Society for Endocrinology, UK
Spanish Society of Endocrinology and Nutrition
Swedish Endocrine Society
Swiss Society of Endocrinology and Diabetes
Tunisian Society of Endocrinology
Society of Endocrinology and Metabolism Turkey
Ukraine Diabetology Association
Association of Endocrinologists of the Ukraine

Introduction

The ESE Recommended Curriculum of Specialisation in Clinical Endocrinology, Diabetes and Metabolism has been developed by the ESE's Education Committee. The committee reviewed and compared curricula from across Europe and established the key criteria required to practice as a clinical endocrinologist, listing those areas in which an endocrinologist should be expected to be proficient.

ESE provides this resource for trainee endocrinologists to assess their knowledge, skills and behaviour, ensuring they are proficient in all of the required areas to practice with competence throughout Europe. Additionally, this document will enable education providers to monitor their endocrine training programmes, ensuring that they cover adequately their intended subject areas.

The ESE Recommended Curriculum of Specialisation in Clinical Endocrinology, Diabetes and Metabolism focuses on the knowledge requirements for the clinical treatment of adult endocrine disorders. Paediatric endocrinology, as a separate specialty, is not considered within the scope of this document. The document aims to provide an overview of the expected areas of knowledge and is not intended to provide specific details of disorders or their treatment. This document will be subject to regular review and evaluation and will be modified as required.

This document represents the minimum expected criteria. It may be deemed necessary that national programmes, developed using this document as a template, include additional areas. The drugs or treatments which should be used may vary depending on local availability or regulations and should therefore be defined locally.

The aspiring clinical endocrinologist 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 endocrine disorders listed in the curriculum.

An additional section highlights the key techniques required for routine endocrine clinical diagnosis. For each of these techniques the clinician should understand the theory, practical application and interpretation of the data obtained. They should be able to explain these techniques to the patient taking into account the patient's knowledge level and emotional condition.

Endocrinologists should not work in isolation. They should lead and build multidisciplinary teams in order to obtain the best outcome for patients. Such a team may include specialist surgeons or neurosurgeons, oncologists, radiotherapists, specialist nurses and other allied health professionals.

A clinical endocrinologist able to demonstrate the above competency for each of the sections outlined in this curriculum should be confident of their ability to practice clinical endocrinology throughout Europe.

1. Diabetes mellitus

- 1.1. Type 1 diabetes
- 1.2. Type 2 diabetes
- 1.3. Other specific types of diabetes
 - 1.3.1. Latent autoimmune diabetes in adults (LADA)
 - 1.3.2. Maturity onset diabetes of the young (MODY)
 - 1.3.3. Maternally inherited Diabetes and Deafness (MIDD)
 - 1.3.4. Other genetic defects and syndromes associated with diabetes
 - 1.3.5. New onset diabetes mellitus after transplantation
 - 1.3.6. Diseases of the exocrine pancreas
 - 1.3.7. Malnutrition-related diabetes mellitus
 - 1.3.8. Drug-associated diabetes
 - 1.3.8.1. Corticosteroid-induced diabetes
- 1.4. Gestational diabetes
- 1.5. Pre-diabetes
- 1.6. Age-related conditions and diabetes
 - 1.6.1. Young people
 - 1.6.2. Elderly people
- 1.7. Diabetic emergencies
 - 1.7.1. Diabetic ketoacidosis
 - 1.7.2. Hyperosmolar hyperglycaemic state
 - 1.7.3. Hypoglycaemia
- 1.8. Management of patients with diabetes during acute illness or surgery
- 1.9. Conception and pregnancy in diabetes
- 1.10. Complications of diabetes
 - 1.10.1. Screening for the complications of diabetes
 - 1.10.2. Cardiovascular macrovascular complications
 - 1.10.3. Eye disease
 - 1.10.4. Renal disease and hypertension
 - 1.10.5. Neuropathy and erectile dysfunction
 - 1.10.6. Autonomic neurological complications
 - 1.10.7. Foot disease
 - 1.10.8. Lipid disease
 - 1.10.9. Hypoglycaemia unawareness
- 1.11. Nutrition and metabolic support
- 1.12. Diabetes technology
 - 1.12.1. Insulin pumps

1.12.2. Continuous glucose monitoring

1.12.2.1. Flash glucose monitoring

1.13. Diabetes and driving

2. Lipid disorders

2.1. Advanced lipoprotein testing

2.2. Genetic lipid disorders

2.3. Disorders of high-density lipoprotein cholesterol

2.4. Atherogenic dyslipidemia (of insulin resistance and diabetes mellitus)

2.5. Hyperlipidemia in solid-organ transplantation

2.6. Lipodystrophy syndromes

2.7. Serum lipid disorders in patients with HIV

3. Obesity and bariatric endocrinology

3.1. Diet, psychobehavioural and medical approach

3.2. Bariatric surgery

3.2.1. Physiological and metabolic effects of bariatric surgery

3.2.2. Complications of bariatric surgery

3.3. Hereditary causes

4. Pituitary

4.1. Hyperfunction of pituitary gland

4.1.1. Hyperprolactinemia

4.1.2. Acromegaly and gigantism

4.1.3. Cushing's syndrome

4.1.3.1. Cushing's disease

4.1.3.1.1. Nelson's syndrome

4.1.3.2. ACTH-independent CS (see 7.2.5)

4.1.3.3. Ectopic ACTH syndrome

4.1.3.4. Pseudo-Cushing's syndrome

4.1.4. Thyrotropinoma

4.1.5. Gonadotropinoma

4.2. Hypopituitarism

4.2.1. Anterior pituitary deficiency

4.2.2. Posterior pituitary deficiency

4.2.3. Hypothalamic dysfunction

4.2.4. Pituitary dysfunction in systemic disorders

4.3. Pituitary tumours

- 4.3.1. Incidentaloma
- 4.3.2. Pituitary adenoma
- 4.3.3. Inherited forms of pituitary adenoma
- 4.3.4. Craniopharyngioma
- 4.3.5. Rathke's cleft cyst
- 4.3.6. Empty sella syndrome
- 4.3.7. Pituitary carcinoma
- 4.3.8. Pituitary apoplexy
- 4.3.9. Infiltrative Pituitary disorders
- 4.3.10. Non-pituitary sellar masses
- 4.3.11. Indications and complications of pituitary surgery
- 4.3.12. Indications and complications of radiotherapy
- 4.4. Pituitary disorders during pregnancy

5. Thyroid

- 5.1. Thyrotoxicosis
 - 5.1.1. Graves-Basedow
 - 5.1.1.1. Graves' orbitopathy
 - 5.1.2. Toxic adenoma
 - 5.1.3. Toxic multinodular goitre
 - 5.1.4. Other causes
 - 5.1.4.1. Hyperthyroidism factitia
 - 5.1.4.2. Amiodarone induced thyrotoxicosis
 - 5.1.4.3. Ectopic thyroid tissue
- 5.2. Hypothyroidism
 - 5.2.1. Autoimmune hypothyroidism
 - 5.2.2. Congenital hypothyroidism
- 5.3. Thyroid emergencies
 - 5.3.1. Thyroid crisis or storm
 - 5.3.2. Myxoedema coma
- 5.4. Thyroiditis
 - 5.4.1. Subacute thyroiditis
 - 5.4.2. Autoimmune thyroiditis
 - 5.4.3. Riedel's thyroiditis
 - 5.4.4. Acute Bacterial thyroiditis
- 5.5. Thyroid neoplasms
 - 5.5.1. Incidentaloma
 - 5.5.2. Follicular adenoma

- 5.5.3. Thyroid carcinoma
 - 5.5.3.1. Well-differentiated
 - 5.5.3.1.1. Papillary
 - 5.5.3.1.2. Follicular
 - 5.5.3.2. Medullary
 - 5.5.3.3. Anaplastic
- 5.5.4. Goitre
 - 5.5.4.1. Diffuse goitre
 - 5.5.4.2. Nodular and multinodular goitre
- 5.6. Thyroid hormone resistance
- 5.7. Non-thyroidal illness syndrome
- 5.8. Thyroid disease in pregnancy
 - 5.8.1. Postpartum thyroiditis
- 5.9. Disorders of iodine-deficiency

6. Parathyroid, calcium and bone

- 6.1. Hyperparathyroidism and other disorders of parathyroid gland
 - 6.1.1. Primary hyperparathyroidism
 - 6.1.2. Familial hypocalciuric hypercalcemia
 - 6.1.3. Secondary hyperparathyroidism
 - 6.1.4. Tertiary hyperparathyroidism
 - 6.1.5. Parathyroid carcinoma
 - 6.1.6. Other inherited forms
- 6.2. Hypoparathyroidism
 - 6.2.1. Idiopathic hypoparathyroidism
 - 6.2.2. Post-surgical hypoparathyroidism
 - 6.2.3. Pseudohypoparathyroidism
 - 6.2.3.1. Pseudopseudohypoparathyroidism
 - 6.2.4. Other inherited forms
- 6.3. Vitamin D deficiency
- 6.4. Osteoporosis
 - 6.4.1. Postmenopausal osteoporosis
 - 6.4.2. Osteoporosis in men
 - 6.4.3. Secondary osteoporosis
- 6.5. Measurement of bone mass and fracture risk assessment
 - 6.5.1. Tools for fracture risk assessment
 - 6.7.3. Bone imaging and structure parameters

6.5.2. Biochemical markers of bone turnover

6.5.3. Dual-energy X-ray Absorptiometry

6.6. Bone and mineral disorders

6.6.1. Other causes of hyper- and hypo-calcaemia

6.6.2. Hypophosphatemia

6.6.3. Rickets and osteomalacia

6.6.4. X-linked hyperphosphaturic hypophosphatemia

6.6.5. Hypophosphatasia

6.6.6. Osteogenesis imperfecta

6.6.7. Paget's disease of bone

6.6.8. Fibrous dysplasia

6.6.9. High bone mass disorders

7. Adrenal

7.1. Primary adrenal insufficiency

7.1.1. Addison's disease

7.1.2. Mineralocorticoid deficiency

7.1.3. Other causes of adrenal deficiency

7.2. Adrenocortical hyperfunction

7.2.1. Primary aldosteronism

7.2.2. Glucocorticoid remediable aldosteronism

7.2.3. Apparent mineralocorticoid excess syndrome

7.2.4. Liddle's syndrome

7.2.5. Cushing's syndrome

7.3. Congenital adrenal hyperplasia

7.4. Adrenal tumours

7.4.1. Adrenal incidentaloma

7.4.2. Adrenal hyperplasia

7.4.3. Adrenal adenoma

7.4.4. Adrenocortical carcinoma

7.4.5. Pheochromocytoma and paraganglioma

7.4.5.1. Hereditary forms

8. Reproductive endocrinology and sexual function

8.1. Hypogonadotropic hypogonadism

8.1.1. Inherited

8.1.1.1. Kallman's syndrome

8.1.2. Acquired

- 8.2. Growth and development
- 8.3. Puberty
 - 8.3.1. Delayed puberty
 - 8.3.2. Precocious puberty
- 8.4. Polycystic ovary syndrome
- 8.5. Hormonal Contraception
- 8.6. Menopause
 - 8.6.1. Premature ovarian failure
 - 8.6.2. Ovarian hyperthecosis
- 8.7. Primary ovarian failure
 - 8.7.1. Turner's syndrome
- 8.8. Ovarian tumours
- 8.9. Testicular dysfunction
 - 8.9.1. Klinefelter syndrome
 - 8.9.2. Other chromosomal aberrations
 - 8.9.3. Sertoli cell only syndrome
- 8.10. Testicular tumours
- 8.11. Erectile dysfunction
- 8.12. Gynaecomastia
- 8.13. Management of the infertile couple
 - 8.13.1. Ovulation induction
 - 8.13.2. Induction of spermatogenesis
 - 8.13.3. Assisted reproduction
- 8.14. Disorders of sexual development
- 8.15. Gender dysphoria
 - 8.15.1. Male-to-Female
 - 8.15.2. Female-To-Male

9. Electrolytes and fluid balance

- 9.1. Hyponatremia
 - 9.1.1. Syndrome of inappropriate secretion of antidiuretic hormone
 - 9.1.2. Other causes
- 9.2. Polydipsia
- 9.3. Hypokalaemia
- 9.4. Hypomagnesemia

10. Neuroendocrine tumours

- 10.1. Thymus and mediastinal carcinoid tumours
- 10.2. Pulmonary neuroendocrine tumours

- 10.3. Small intestinal neuroendocrine neoplasms
- 10.4. Pancreatic neuroendocrine neoplasms
 - 10.4.1. Insulinomas
- 10.5. Appendiceal carcinoids
- 10.6. Other neuroendocrine tumours (Breast, Ovary)
- 10.7. Functional neuroendocrine tumours
 - 10.7.1. Insulinoma
 - 10.7.2. Gastrinoma
 - 10.7.3. Glucagonoma
 - 10.7.4. Ectopic ACTH syndrome
- 10.8. Carcinoid syndrome

11. Inherited endocrine tumour syndromes

- 11.1. Multiple endocrine neoplasia
 - 11.1.1. MEN1
 - 11.1.2. MEN2 (*Formerly MEN2a*)
 - 11.1.3. MEN3 (*Formerly MEN2b*)
 - 11.1.4. MEN4
- 11.2. von Hippel-Lindau disease
- 11.3. Familial paraganglioma syndromes
- 11.4. Neurofibromatosis type 1
- 11.5. Tuberous sclerosis
- 11.6. Carney complex

12. Polyendocrine syndromes

- 12.1. APS 1
- 12.2. APS 2/3

13. Treatment-induced endocrine dysfunction

- 13.1. Interferon
- 13.2. Checkpoint-inhibitors
- 13.3. Tyrosine kinase inhibitors
- 13.4. Lithium
- 13.5. Late effects in long term paediatric cancer survivors

14. Hormone Abuse

- 14.1. Testosterone and anabolic steroids
- 14.2. Peptide hormones

15. Endocrine-disrupting chemicals

- 15.1. Characteristics
- 15.2. Mechanism of action
- 15.3. Endocrine effects

16. Diagnostic techniques in endocrinology

- 16.1. Assessment of hormones and pitfalls of laboratory testing
 - 16.1.1. RIA
 - 16.1.2. ELISA
 - 16.1.3. LC-MS/MS
 - 16.1.4. Point-of-care testing
- 16.2. Dynamic endocrine function testing
- 16.3. Conventional Imaging
 - 16.3.1. Ultrasound
 - 16.3.1.1. Thyroid including fine needle aspiration and cytology
 - 16.3.1.2. Pancreatic endoscopic ultrasound
 - 16.3.1.3. Ovarian and testicular
 - 16.3.2. CT
 - 16.3.3. MRI
- 16.4. Functional Imaging
 - 16.4.1. Technetium, Iodine scintigraphy
 - 16.4.2. Technetium Sestamibi scintigraphy, SPECT/CT
 - 16.4.3. MIBG scintigraphy
 - 16.4.4. Somatostatin receptor scintigraphy
 - 16.4.5. PET, PET/CT and PET/MRI
 - 16.4.5.1. ^{18}F -FDG
 - 16.4.5.2. ^{68}Ga -DOTATATE
 - 16.4.5.3. ^{11}C -methionine/ ^{18}F -choline
 - 16.4.6. Bone scintigraphy
- 16.5. Angiographic techniques and localisation with venous sampling
 - 16.5.1. Bilateral inferior petrosal sinus sampling for ACTH
 - 16.5.2. Bilateral adrenal venous sampling for aldosterone
 - 16.5.3. Intra-arterial calcium stimulation with hepatic venous sampling for functioning insulinomas and gastrinomas
 - 16.5.4. Parathyroid venous sampling