

Metabolic Problems and Endocrinology Summary

The role of the GP in the care of people with metabolic and endocrine problems

Good management of common metabolic and endocrine conditions can prevent or postpone associated morbidity and mortality. Additionally, certain conditions such as diabetes and obesity can be prevented through lifestyle and public health measures.

As a GP, your role is to:

- Diagnose and manage common disorders such as diabetes mellitus, hyperlipidaemia, thyroid and reproductive disorders
- Recognise rarer and potentially life-threatening disorders such as Addison's disease
- Arrange and interpret appropriate biochemical tests for diagnosing and monitoring metabolic or endocrine disorders in a primary care setting
- Understand and address the social, psychological and environmental factors underpinning obesity, diabetes and other metabolic and endocrine disorders
- Understand the relationship between metabolic/ endocrine disorders and other disorders such as cardiovascular disease and cancer
- Coordinate care, encourage self-management, and involve other agencies where appropriate
- Recognise and manage metabolic and endocrine emergencies.

Key Areas for Exam preparation

Common and important conditions

- Adrenal diseases including Addison's disease, Cushing's syndrome and disease, pheochromocytoma, hyperaldosteronism, primary and secondary malignancy, ACTH secreting tumours, congenital adrenal hyperplasia
- Adverse metabolic effects of prescribed drugs (e.g. hypokalaemia with diuretics)
- Carcinoid syndrome, multiple endocrine neoplasia
- Diabetes mellitus — type 1, type 2, and rarer types such as MODY (maturity onset diabetes of the young) and LADA (latent autoimmune diabetes in adults), pre-diabetes, impaired fasting glucose, impaired glucose tolerance, insulin resistance, gestational diabetes.

In the context of these conditions, you should be aware of:

- diagnostic thresholds;
- self-monitoring of glucose levels;
- skin and eye manifestations, renal and neurological complications;
- macrovascular complications and cardiovascular risk;
- acute complications such as hypoglycaemia, diabetic ketoacidosis, non-ketotic hyperglycaemia;
- lifestyle factor modification (e.g. diet, physical activity, smoking)
- medication in diabetes management, including glucose and lipid lowering therapies, anti-platelets, ACE inhibitors and antihypertensives; recommended treatment targets; and insulin regimes, administration and dosages
- Disorders of calcium metabolism, including hypoparathyroidism, hyperparathyroidism and osteomalacia; association with chronic kidney disease and malignancy (e.g. bony metastases and myeloma)
- Disorders of sex hormones (e.g. hirsutism, virilism, gynaecomastia, impotence, androgen deficiency, androgen insensitivity syndrome)
- Endocrine manifestations of non-endocrine diseases (e.g. bronchogenic carcinoma with inappropriate ADH secretion)
- Haemochromatosis: primary and secondary, and other disorders of iron metabolism
- Hyperlipidaemias: familial and acquired
- Hyperprolactinaemia and its causes (e.g. drug-induced, chronic renal failure, bronchogenic carcinoma, hypothyroidism, pituitary)
- Hyperuricaemia: primary and secondary (including haematological and drug-induced causes) and its associations with obesity, diabetes, hypertension and dyslipidaemia
- Hypothalamic causes of hormonal disturbances (e.g. hyperprolactinaemia, drug-induced)
- Inherited metabolic diseases (e.g. phenylketonuria, glycogen storage diseases, porphyrias)
- Metabolic causes of unconsciousness (e.g. hypoglycaemia, diabetic ketoacidosis, hyponatraemia, hypothyroidism, adrenal insufficiency)
- Non-alcoholic fatty liver disease (NAFLD), including its associations with diabetes, obesity and metabolic syndrome, and its consequences
- Osteoporosis
- Overweight and obesity:
- Assessment and classification using Body Mass Index (BMI), and limitations of this method
- Health consequences of obesity (including malnutrition, increased morbidity and reduced life expectancy)
- Health promotion advice (including nutrition, smoking cessation, physical activity)
- Pharmacological therapies for weight reduction
- Risks and benefits of bariatric surgery
- Direct and indirect impact of obesity on a wide range of disease areas

- Pituitary diseases including acromegaly, primary and secondary hypopituitarism, diabetes insipidus
- Poisoning (deliberate or unintentional) including by food, drugs (prescribed, over the counter or non-medicinal) or other chemicals
- Polycystic ovary syndrome (see RCGP Topic Guide *Gynaecology and Breast Health*)
- Psychogenic polydipsia
- Replacement and therapeutic steroid therapy
- Thyroid diseases including goitre, hypothyroidism, hyperthyroidism, benign and malignant tumours, thyroid eye disease, thyroiditis, neonatal hyper- and hypo-thyroidism:
 - Antibody testing, thyroxine replacement therapy and monitoring
 - Associations with other conditions, including cardiovascular disease
 - Potential for thyroxine abuse and strategies to reduce dosage
- Vitamin D deficiency, including its causes, health consequences/complications, testing, and replacement therapy.

Suggested Resources

General Information

- <https://elearning.rcgp.org.uk>
- <https://www.gov.uk/browse/driving/disability-health-condition>
- <https://www.diabetes.org.uk>
- Oxford handbook of general practice 4th edition p.368
- Kumar and Clark's clinical medicine 7th edition p.1012-14
- Oxford handbook of general practice 4th edition p.344-349, 352-361
- Illustrated textbook of paediatrics 4th edition - T.Lissauer, G.Clayden p.433-441

ACTH secreting tumours:

- <https://www.ncbi.nlm.nih.gov/books/NBK12462/>

Addison's disease

- <https://cks.nice.org.uk/addisons-disease>
- <https://www.nhs.uk/conditions/addisons-disease/v>
- <https://www.niddk.nih.gov/health-information/endocrine-diseases/adrenal-insufficiency-addisons-disease>

Adrenal diseases

- <https://www.evidence.nhs.uk/search?q=addison%27s+disease>
- <https://www.evidence.nhs.uk/search?q=Cushing%20disease>
- <https://www.evidence.nhs.uk/search?q=phaeochromocytoma>
- <https://www.evidence.nhs.uk/search?q=hyperaldosteronism>
- <https://www.evidence.nhs.uk/search?q=ACTH>
- <https://www.evidence.nhs.uk/search?q=congenital%20adrenal%20hyperplasia>

Congenital adrenal hyperplasia

- <https://patient.info/doctor/congenital-adrenal-hyperplasia-pro>
- <https://gpnotebook.com/simplepage.cfm?ID=-1831862268>
- <https://www.gosh.nhs.uk/conditions-and-treatments/conditions-we-treat/congenital-adrenal-hyperplasia-cah>

Carcinoid syndrome, multiple endocrine neoplasia

- <https://www.evidence.nhs.uk/search?q=carcinoid%20syndrome>
- <https://www.evidence.nhs.uk/search?q=multiple%20endocrine%20neoplasm>

Diabetes mellitus

- <https://www.evidence.nhs.uk/search?q=diabetes+type+1>
- <https://gpnotebook.com/simplepage.cfm?ID=1214971904&linkID=78836&cook=yes>
- <https://www.nhs.uk/conditions/type-1-diabetes/>
- <https://cks.nice.org.uk/insulin-therapy-in-type-1-diabetes>
- <https://www.evidence.nhs.uk/search?q=diabetes%20type%202>
- <https://www.evidence.nhs.uk/search?q=MODY>
- <https://www.evidence.nhs.uk/search?q=LADA>
- <https://www.evidence.nhs.uk/search?q=pre%20diabetes>
- <https://www.evidence.nhs.uk/search?q=impaired%20fasting%20glucose>
- <https://www.evidence.nhs.uk/search?q=impaired%20glucose%20tolerance>
- <https://www.evidence.nhs.uk/search?q=insulin%20resistance>
- <https://www.evidence.nhs.uk/search?q=gestational+diabetes>
- <https://cks.nice.org.uk/diabetes-type-2>
- <https://www.nhs.uk/conditions/type-2-diabetes/>
- <https://www.diabetes.org.uk/diabetes-the-basics/what-is-type-2-diabetes>
- <https://www.diabetes.co.uk/type2-diabetes.html>
- <https://www.nice.org.uk/guidance/NG28>
- <https://cks.nice.org.uk/insulin-therapy-in-type-2-diabetes>

Cushing's Syndrome

- <https://www.niddk.nih.gov/health-information/endocrine-diseases/cushings-syndrome>
- <https://www.nhs.uk/conditions/cushings-syndrome/>
- <https://www.pituitary.org.uk/information/pituitary-conditions/cushings-disease/>
- <https://labtestsonline.org.uk/conditions/cushings-syndrome>

Gestational diabetes

- <https://pathways.nice.org.uk/pathways/diabetes-in-pregnancy>
- <https://www.nhs.uk/conditions/gestational-diabetes/>
- <https://www.diabetes.org.uk/diabetes-the-basics/gestational-diabetes>
- The midwives' guide to key medical conditions – L.Wylie, H.Bryce p.130-134
- Obstetrics and gynaecology an illustrated colour text, J.Pitkin, A B. Peattie, B A. Magowan p.28-31

Disorders of calcium metabolism

- <https://www.evidence.nhs.uk/search?q=hypoparathyroidism%2C>
- <https://www.evidence.nhs.uk/search?q=hyperparathyroidism%2C>
- <https://www.evidence.nhs.uk/search?q=osteomalacia>
- <https://www.nhs.uk/conditions/hyperparathyroidism/>
- <https://www.endocrineweb.com/conditions/hyperparathyroidism/hyperparathyroidism>
- <https://www.nice.org.uk/guidance/ng132/informationforpublic>
- <https://www.nhs.uk/conditions/multiple-myeloma/>
- <https://www.royalmarsden.nhs.uk/your-care/cancer-types/blood-cancers/myeloma/myeloma-information>
- <https://www.uclh.nhs.uk/OurServices/ServiceA-Z/Cancer/CBD/MYL/Pages/Whatismyeloma.aspx>

Disorders of sex hormones

- <https://cks.nice.org.uk/hirsutism>
- <https://www.evidence.nhs.uk/search?q=virilism>
- <https://www.evidence.nhs.uk/search?q=gynaecomastia>
- <https://www.evidence.nhs.uk/search?q=impotence>
- <https://www.evidence.nhs.uk/search?q=androgen%20deficiency%20syndrome>
- <https://www.evidence.nhs.uk/search?q=androgen%20insensitivity%20syndrome>
- <https://cks.nice.org.uk/hirsutism>
- <https://cks.nice.org.uk/erectile-dysfunction>
- <https://www.nhs.uk/conditions/hirsutism/>
- <https://www.britishskinfoundation.org.uk/hirsutism>
- <https://bnf.nice.org.uk/treatment-summary/erectile-dysfunction.html>
- British Society for Sexual Medicine Guidelines on the Management of Erectile Dysfunction in Men—2017 Geoff Hackett, MD, Mike Kirby, MD, Kevan Wylie, MD, Adrian Heald, MD, Nick Ossei-Gerning, MD, David Edwards, MD, and Asif Muneer, MD, FRCS(Urol)
- <http://www.bssm.org.uk/wp-content/uploads/2018/09/ED-Practical-Guide-v3-for-BSSM-review.pdf>
- <https://www.nhs.uk/common-health-questions/mens-health/what-is-gynaecomastia/v>
- <https://www.bmj.com/content/354/bmj.i4833.full>
- <https://www.gponline.com/gp-management-gynaecomastia/cancer/womens/article/1118276>
- <https://patient.info/doctor/gynaecomastia>

Endocrine manifestations of non-endocrine diseases

- <https://www.evidence.nhs.uk/search?q=inappropriate%20ADH%20secretion>
- <https://cks.nice.org.uk/hyponatraemia>
- http://ndt.oxfordjournals.org/content/29/suppl_2/i1.full.pdf+html

Hyperaldosteronism

- <https://www.uptodate.com/contents/pathophysiology-and-clinical-features-of-primary-aldosteronism>

Haemochromatosis

- <https://www.evidence.nhs.uk/search?q=Haemochromatosis%3A%20>
- <https://www.evidence.nhs.uk/search?q=primary%20haemochromatosis>
- <https://www.evidence.nhs.uk/search?q=secondary%20haemochromatosis>
- <https://www.nhs.uk/conditions/haemochromatosis/>
- <https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/haemochromatosis/>
- <https://bjgp.org/content/63/611/331>
- http://www.newcastle-hospitals.org.uk/services/ng_npcg_common_hh.aspx

Hyperlipidaemias

- <https://www.evidence.nhs.uk/search?q=hyperlipidaemia>
- <https://www.evidence.nhs.uk/search?q=familial%20hyperlipidaemia>
- <https://www.evidence.nhs.uk/search?q=acquired%20hyperlipidaemia>
- <https://www.nhs.uk/conditions/high-cholesterol/>
- <https://cks.nice.org.uk/hypercholesterolaemia-familial>
- <https://www.nice.org.uk/guidance/cg181>

Hyperprolactinaemia

- <https://www.evidence.nhs.uk/search?q=Hyperprolactinaemia>
- <https://www.gponline.com/hyperprolactinaemia-diagnosis-management/neurology/article/937857>
- <https://www.pituitary.org.uk/information/pituitary-conditions/prolactinoma/>
- <https://patient.info/doctor/hyperprolactinaemia-and-prolactinoma>
- <https://academic.oup.com/jcem/article/96/2/273/2709487>

Hyperuricaemia

- <https://www.evidence.nhs.uk/search?q=Hyperuricaemia>
- <https://www.evidence.nhs.uk/search?q=Primary%20Hyperuricaemia>
- <https://www.evidence.nhs.uk/search?q=Secondary%20hyperuricaemia>
- <https://www.nhs.uk/conditions/gout/>
- <https://cks.nice.org.uk/gout>

Hypothalamic causes of hormonal disturbances

- <https://www.evidence.nhs.uk/search?q=hyperprolactaemia>
- <https://www.evidence.nhs.uk/search?q=Drug%20induced%20Hypothalamic%20causes%20of%20hormonal%20disturbances%20>

Inherited metabolic diseases

- <https://www.evidence.nhs.uk/search?q=phenoketonia>
- <https://www.evidence.nhs.uk/search?q=glycogen%20storage%20diseases>
- <https://www.evidence.nhs.uk/search?q=porphoria>
- <https://www.nhs.uk/conditions/phenylketonuria/>
- <https://patient.info/doctor/phenylketonuria-pro>
- [http://www.labs.gosh.nhs.uk/laboratory-services/genetics/tests/glycogen-storage-disease-type-1a-\(gsd1a\)](http://www.labs.gosh.nhs.uk/laboratory-services/genetics/tests/glycogen-storage-disease-type-1a-(gsd1a))
- <https://patient.info/childrens-health/glycogen-storage-disorders-leaflet>
- <https://agsd.org.uk/>

Metabolic causes of unconsciousness

- <https://www.webmd.com/brain/coma-types-causes-treatments-prognosis#1>
- <https://www.sciencedirect.com/topics/medicine-and-dentistry/hypoglycemic-coma>
- [https://www.rcem.ac.uk/docs/Local%20Guidelines_Audit%20Guidelines%20Protocols/12hXii.%20Hyponatraemia%20\(Wirral%20University%20Teaching%20Hospital%20NHSFT,%202012\).pdf](https://www.rcem.ac.uk/docs/Local%20Guidelines_Audit%20Guidelines%20Protocols/12hXii.%20Hyponatraemia%20(Wirral%20University%20Teaching%20Hospital%20NHSFT,%202012).pdf)

Metabolic side effects of medication

- <https://www.ncbi.nlm.nih.gov/pubmed/17627711>
- <https://bmjopen.bmj.com/content/5/10/e007633.full>
- <https://bmcpyschiatry.biomedcentral.com/articles/10.1186/s12888-017-1539-0>
- <https://bnf.nice.org.uk/>
- <https://www.medicines.org.uk/emc/>

Non-alcoholic fatty liver disease

- <https://www.evidence.nhs.uk/search?q=NAFLD>
- <https://cks.nice.org.uk/non-alcoholic-fatty-liver-disease-nafld>
- <https://pathways.nice.org.uk/pathways/non-alcoholic-fatty-liver-disease>
- <https://cks.nice.org.uk/cirrhosis>
- <https://www.nice.org.uk/guidance/ng49>
- <https://www.bsg.org.uk/resource/nice-guideline-on-liver-disease-non-alcoholic-fatty-nafld.html>

Osteoporosis

- <https://www.evidence.nhs.uk/search?q=osteoporosis>
- <https://www.nhs.uk/conditions/osteoporosis/>
- <https://cks.nice.org.uk/osteoporosis-prevention-of-fragility-fractures>
- <https://pathways.nice.org.uk/pathways/osteoporosis>
- <https://www.nice.org.uk/guidance/conditions-and-diseases/diabetes-and-other-endocrinal-nutritional-and-metabolic-conditions/osteoporosis>

Overweight and obesity (also see Health Promotion section)

- <https://www.worldobesity.org/training-and-events/training/scope>
- <https://www.aso.org.uk>
- <https://cks.nice.org.uk/obesity>
- <https://www.nice.org.uk/guidance/qs94>
- <https://www.nice.org.uk/guidance/conditions-and-diseases/diabetes-and-other-endocrinal-nutritional-and-metabolic-conditions/obesity>
- <https://www.nhs.uk/conditions/metabolic-syndrome/>

Body Mass Index (BMI)

- <https://www.nhs.uk/live-well/healthy-weight/bmi-calculator/>
- <https://www.evidence.nhs.uk/search?q=BMI>

Health consequences of obesity (including malnutrition, increased morbidity and reduced life expectancy)

- <https://www.evidence.nhs.uk/search?q=obesity>
- <https://www.evidence.nhs.uk/search?q=malnutrition>

Risks and benefits of bariatric surgery

- <https://www.evidence.nhs.uk/search?q=bariatric%20surgery>

Poisoning

- <https://www.evidence.nhs.uk/search?q=poisoning>
- <https://cks.nice.org.uk/poisoning-or-overdose>
- <https://bnf.nice.org.uk/treatment-summary/poisoning-emergency-treatment.html>
- <https://www.toxbase.org/>

Polycystic ovary syndrome

- <https://www.evidence.nhs.uk/search?q=pcos+guidelines>
- <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg33/>
- <https://cks.nice.org.uk/polycystic-ovary-syndrome>
- <https://www.evidence.nhs.uk/search?q=pcos+guidelines>
- <https://www.gponline.com/management-pcos-primary-care/womens-health/article/1322277>
- <https://patient.info/doctor/polycystic-ovary-syndrome-pro>

Pituitary diseases

- <https://www.evidence.nhs.uk/search?q=pituitary%20diseases>
- <https://www.evidence.nhs.uk/search?q=acromegaly>
- <https://www.evidence.nhs.uk/search?q=primary%20hypopituitarism>
- <https://www.evidence.nhs.uk/search?q=secondary%20hypopituitarism>
- <https://www.evidence.nhs.uk/search?q=diabetes%20insipidus>
- <https://pathways.nice.org.uk/pathways/endocrine-nutritional-and-metabolic-conditions#path=view%3A/pathways/endocrine-nutritional-and-metabolic-conditions/endocrine-conditions.xml&content=view-node%3Anodes-pituitary-conditions>
- <https://patient.info/doctor/acromegaly-pro>
- <https://www.gpnotebook.com/simplepage.cfm?ID=1208352768>
- <https://bnf.nice.org.uk/treatment-summary/hypothalamic-and-anterior-pituitary-hormones.html>
- <https://patient.info/doctor/hypopituitarism-pro>
- <https://www.gponline.com/clinical-review-hypopituitarism/article/1063706>
- <https://www.endocrine.org/clinical-practice-guidelines/hormone-replacement-in-hypopituitarism>
- <https://patient.info/doctor/diabetes-insipidus-pro>
- <https://www.nhs.uk/conditions/diabetes-insipidus/>
- <https://www.pituitary.org.uk/information/pituitary-conditions/diabetes-insipidus/>

Psychogenic polydipsia

- <https://bestpractice.bmj.com/topics/en-gb/865>

Phaeochromocytoma

- <https://www.endocrineweb.com/conditions/pheochromocytoma/pheochromocytoma-tumor-central-adrenal>
- https://www.medicinenet.com/pheochromocytoma/article.htm#pheochromocytoma_facts
- <https://www.uptodate.com/contents/clinical-presentation-and-diagnosis-of-pheochromocytoma>

Replacement and therapeutic steroid therapy

- <https://bnf.nice.org.uk/treatment-summary/corticosteroids-replacement-therapy.html>
- <https://www.evidence.nhs.uk/search?q=replacement%20steroids>

Thyroid diseases

- <https://www.evidence.nhs.uk/search?q=goitre>
- <https://www.evidence.nhs.uk/search?q=hypothyroidism>
- <https://www.evidence.nhs.uk/search?q=hyperthyroidism>
- <https://www.evidence.nhs.uk/search?q=thyroid%20tumours>
- <https://www.evidence.nhs.uk/search?q=thyroid%20eye%20disease>
- <https://www.evidence.nhs.uk/search?q=thyroiditis>
- <https://www.evidence.nhs.uk/search?q=neonatal%20hypothyroidism>
- <https://www.evidence.nhs.uk/search?q=neonatal%20hyperthyroidism>
- <https://cks.nice.org.uk/hypothyroidism>
- <https://www.nice.org.uk/guidance/ng145>
- <https://www.nice.org.uk/guidance/conditions-and-diseases/diabetes-and-other-endocrinal-nutritional-and-metabolic-conditions/thyroid-disorders>
- <https://cks.nice.org.uk/hyperthyroidism>

Vitamin D deficiency

- <https://www.evidence.nhs.uk/search?q=vitamin%20D%20deficiency>
- <https://medlineplus.gov/vitaminDdeficiency.html>
- <https://cks.nice.org.uk/vitamin-d-deficiency-in-adults-treatment-and-prevention#!topicSummary>
- <https://cks.nice.org.uk/vitamin-d-deficiency-in-children#!topicSummary>
- <https://www.nice.org.uk/guidance/ph56>
- <https://www.guidelinesinpractice.co.uk/nutrition/top-tips-vitamin-d-deficiency/454118.article>