NEW CURRICULA

Advanced Training in Endocrinology (Paediatrics & Child Health)

Curriculum standards

RACP Specialists. Together

About this document

The new Advanced Training in Endocrinology (PCH) curriculum consists of curriculum standards and learning, teaching, and assessment (LTA) programs.

This document outlines the curriculum standards for Advanced Training in Endocrinology (PCH) for trainees and supervisors. The curriculum standards should be used in conjunction with the Advanced Training in Endocrinology (PCH) LTA programs.

Contents

Program overview

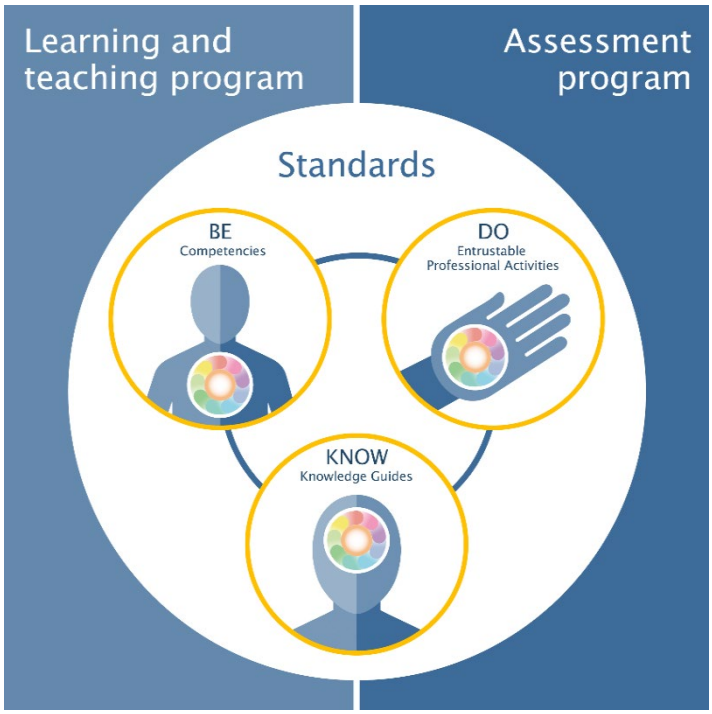
Purpose of Advanced Training

The RACP offers Advanced Training in 33 diverse medical specialties as part of Division, Chapter, or Faculty training programs.

The purpose of Advanced Training is to develop a workforce of physicians who:

- have received breadth and depth of focused specialist training, and experience with a wide variety of health problems and contexts
- are prepared for and committed to independent expert practice, lifelong learning, and continuous improvement
- provide safe, quality health care that meets the needs of the communities of Australia and Aotearoa New Zealand.

RACP curriculum model



The **RACP curriculum model** is made up of curricula standards supported by learning, teaching, and assessment programs.

Learning and teaching programs outline the strategies and methods to learn and teach curricula standards, including required and recommended learning activities.

Assessment programs outline the planned use of assessment methods to provide an overall picture of the trainee's competence over time.

The **curricula standards** outline the educational objectives of the training program and the standard against which trainees' abilities are measured.

- **Competencies** outline the expected professional behaviours, values and practices of trainees in 10 domains of professional practice.

- **Entrustable Professional Activities** (EPAs) outline the essential work tasks trainees need to be able to perform in the workplace.

- **Knowledge guides** outline the expected baseline knowledge of trainees.

Professional Practice Framework

The Professional Practice Framework describes 10 domains of practice for all physicians.

Learning, teaching, and assessment (LTA) structure

The learning, teaching and assessment structure defines the framework for delivery and trainee achievement of the curriculum standards in the Advanced Training program.

Advanced Training is structured in three phases. These phases will establish clear checkpoints for trainee progression and completion.

1	**Specialty foundation**	• Orient trainees and confirm their readiness to progress in the Advanced Training program
2	**Specialty consolidation**	• Continue trainees' professional development in the specialty and support progress towards the learning goals
3	**Transition to Fellowship**	• Confirm trainees' achievement of the curriculum standards, completion of Advanced Training, and admission to Fellowship • Support trainees' transition to unsupervised practice

Figure 1: Advanced Training learning, teaching, and assessment structure

- An **entry decision** is made before entry into the program.
- A **progress decision**, based on competence, is made at the end of each phase of training.
- A **completion decision**, based on competence, is made at the end of the training program, resulting in eligibility for admission to Fellowship.

Advanced Training is a **hybrid time- and competency-based training program**. There is a minimum time requirement of full-time equivalent experience, and progression and completion decisions are based on evidence of trainees' competence.

Endocrinology (Paediatrics & Child Health) specialty overview

Endocrinology is the study of hormones and endocrine glands. The specialty of clinical endocrinology encompasses the diagnosis and management of disorders of the endocrine system. Hormones from the body's major glands (adrenal, gonads, pancreas, parathyroid, pituitary, and thyroid) regulate growth and development, bone health, metabolism, electrolytes, blood pressure, reproduction, and ageing.

Paediatric endocrinologists assess, diagnose, and manage neonates, children, and adolescents with endocrine disorders resulting from an excess or deficiency of hormone action. They perform diagnostic and laboratory analyses, provide holistic treatment, and conduct basic and applied research in a wide range of hormonal and metabolic conditions.

The broad range of endocrine conditions seen in the paediatric age group can have a significant impact on a child's long-term physical and emotional wellbeing.

The nature of care provided by endocrinologists includes:

- **diagnosing and treating disorders of the endocrine system**. The broad spectrum of conditions managed by the paediatric endocrinologist includes type 1 and type 2 diabetes, hypoglycaemia, variations in growth and puberty, neuroendocrine conditions, benign and malignant glandular tumours, genetic lipid disorders, endocrine effects of oncology treatment, variations of sex and gender, metabolic bone disease, and over-or underactivity of the pituitary, thyroid, and adrenal glands.
- **specialist investigation and laboratory skills**. Paediatric endocrinologists develop expertise in the use of technology to monitor and treat endocrine conditions, such as continuous glucose monitoring systems (CGMS) and continuous subcutaneous insulin infusions (CSII). Endocrinologists need to be able to interpret biochemical and dynamic tests relating to endocrine diagnosis and have a good understanding of the laboratory methods underlying these analyses and their limitations. They also work closely with geneticists to investigate the genetic basis for many paediatric endocrine conditions. Consequently, experience in clinical or laboratory research and in diagnostic endocrine laboratory medicine is a strongly recommended component of training.
- **long-term patient management.** Endocrine conditions are diverse in their requirement for specialist medical advice, and in most cases their impact is lifelong. Many pose a diagnostic challenge, and in some, the application of new or partially effective treatment requires fine judgement. Endocrine disorders affect many body systems and call for expertise in interpretation of clinical biochemistry and immunochemistry, including dynamic tests, genetic testing and counselling, and a strong therapeutic partnership between the endocrinologist, the patient, and their family and/or carers.
- **life-stage endocrine care.** Paediatric endocrinologists have expertise in managing young people with hormone disorders from birth to adulthood to achieve optimal growth and development to progress through puberty. Endocrine disorders may need to be managed in conjunction with other comorbidities which may impact growth and development.
- **lifestyle management advice.** Paediatric endocrinologists have expertise in providing lifestyle management advice, including for endocrine-related obesity / overweight, diabetes, metabolic bone, and lipid disorders.

- **managing medications.** Endocrinologists have expertise in the management of complex medications, and specialist knowledge of medication delivery devices and technology.
- **endocrine care delivery.** Endocrinology services are extremely valuable across the broad spectrum of health care. Endocrinologists predominantly provide consultation services to hospital inpatients, as well as dedicated acute inpatient endocrine care. Most endocrine care is delivered in outpatient settings, in hospital clinics, with some private practice. Endocrine care is well suited to the incorporation of telehealth and other digital health technologies.

Endocrinologists are leaders in the treatment and management of disorders of the endocrine system, with a focus on communication, problem solving, and research.

Endocrinologists require professional skills and qualities that include:

- **communication and interpersonal skills.** Endocrinologists have an important role in taking complete medical histories, determining differential diagnoses, and explaining investigations and treatment options, which may include advice on lifestyle, nutrition, medications, and preventative treatments. Endocrinologists work with multidisciplinary teams including diabetes educators, dietitians, psychologists, social workers, and genetic counsellors, as well as other medical specialists. Communication with referring doctors, including general practitioners, is paramount.
- **attention to detail and problem-solving skills.** Endocrinologists must carefully analyse medical histories, physical examination, and investigation results to make accurate diagnoses.
- **research.** Conducting research on the endocrine system and its diseases, disorders, and conditions to increase understanding of endocrine disorders and develop new treatments is an important component of a career in paediatric endocrinology. Remaining up to date on current discoveries, developments, trends, research, and technology is necessary to deliver the best endocrine care.

Endocrinology (Paediatrics & Child Health) learning goals

The curriculum standards are summarised as 23 learning goals. The learning goals articulate what trainees need to be, do, and know, and are assessed throughout training.

BE Competencies	1. Professional behaviours
DO EPAs	2. Team leadership 3. Supervision and teaching 4. Quality improvement 5. Clinical assessment and management 6. Management of transitions from paediatric to adult care 7. Acute care 8. Longitudinal care 9. Communication with patients 10. Procedures 11. Clinic management 12. Manage patients with untreatable life-limiting cardiac conditions
KNOW Knowledge guides	13. Scientific foundations of endocrinology 14. Disorders of glucose metabolism 15. Disorders of body weight 16. Lipid disorders 17. Pituitary, hypothalamus, and electrolyte disorders 18. Thyroid disorders 19. Adrenal disorders 20. Parathyroid, calcium, and bone disorders 21. Endocrine oncology 22. Disorders of growth and puberty 23. Variations in sex characteristics and gender identity

Curriculum standards

Competencies

Competencies outline the expected professional behaviours, values and practices that trainees need to achieve by the end of training.

Competencies are grouped by the 10 domains of the professional practice framework.

Competencies will be common across training programs.

Learning goal 1: Professional behaviours

Medical expertise

Professional standard: Physicians apply knowledge and skills informed by best available current evidence in the delivery of high-quality, safe practice to facilitate agreed health outcomes for individual patients and populations.

Knowledge: Apply knowledge of the scientific basis of health and disease to the diagnosis and management of patients.

Synthesis: Gather relevant data via age- and context-appropriate means to develop reasonable differential diagnoses, recognising and considering interactions and impacts of comorbidities.

Diagnosis and management: Develop diagnostic and management plans that integrate an understanding of individual patient circumstances, including psychosocial factors and specific vulnerabilities, epidemiology, and population health factors in partnership with patients[1], families, or carers, and in collaboration with the health care team.

[1] References to patients in the remainder of this document may include their families, whānau and/or carers.

Communication

Professional standard: Physicians collate information, and share this information clearly, accurately, respectfully, responsibly, empathetically, and in a manner that is understandable.

Physicians share information responsibly with patients, families, carers, colleagues, community groups, the public, and other stakeholders to facilitate optimal health outcomes.

Effective communication: Use a range of effective and appropriate verbal, nonverbal, written and other communication techniques, including active listening.

Communication with patients, families, and carers: Use collaborative, effective, and empathetic communication with patients, families, and carers.

Communication with professionals and professional bodies: Use collaborative, respectful, and empathetic clinical communication with colleagues, other health professionals, professional bodies, and agencies.

Written communication: Document and share information about patients to optimise patient care and safety.

Privacy and confidentiality: Maintain appropriate privacy and confidentiality, and share information responsibly.

Quality and safety

Professional standard: Physicians practice in a safe, high-quality manner within the limits of their expertise.

Physicians regularly review and evaluate their own practice alongside peers and best practice standards and conduct continuous improvement activities.

Patient safety: Demonstrate a safety focus and continuous improvement approach to own practice and health systems.

Harm prevention and management: Identify and report risks, adverse events, and errors to improve healthcare systems.

Quality improvement: Participate in quality improvement activities to improve quality of care and safety of the work environment.

Patient engagement: Enable patients to contribute to the safety of their care.

Teaching and learning

Professional standard: Physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and evaluating evidence.

Physicians foster the learning of others in their profession through a commitment to mentoring, supervising, and teaching.[2]

Lifelong learning: Undertake effective self-education and continuing professional development.

Self-evaluation: Evaluate and reflect on gaps in own knowledge and skills to inform self-directed learning.

Supervision: Provide supervision for junior colleagues and/or team members.

Teaching: Apply appropriate educational techniques to facilitate the learning of colleagues and other health professionals.

Patient education: Apply appropriate educational techniques to promote understanding of health and disease amongst patients and populations.

Research

Professional standard: Physicians support creation, dissemination and translation of knowledge and practices applicable to health.[3] They do this by engaging with and critically appraising research, and applying it in policy and practice to improve the health outcomes of patients and populations.

Evidence-based practice: Critically analyse relevant literature and refer to evidence-based clinical guidelines and apply these in daily practice.

Research: Apply research methodology to add to the body of medical knowledge and improve practice and health outcomes.

[2] Adapted from Richardson D, Oswald A, Chan M-K, Lang ES, Harvey BJ. Scholar. In: Frank JR, Snell L, Sherbino J, editors. The Draft CanMEDS 2015 Physician Competency Framework – Series IV. Ottawa: The Royal College of Physicians and Surgeons of Canada; 2015 March.

Cultural safety

Professional standard: Physicians engage in iterative and critical self-reflection of their own cultural identity, power, biases, prejudices and practising behaviours. Together with the requirement of understanding the cultural rights of the community they serve; this brings awareness and accountability for the impact of the physician's own culture on decision-making and healthcare delivery. It also allows for an adaptive practice where power is shared between patients, family, whānau and/or community and the physician, to improve health outcomes.

Physicians recognise the patient and population's rights for culturally-safe care, including being an ally for patient, family, whānau and/or community autonomy and agency over their decision-making. This shift in the physician's perspective fosters collaborative and engaged therapeutic relationships, allows for strength-based (or mana-enhanced) decisions, and sharing of power with the recipient of the care, optimising health care outcomes.

Physicians critically analyse their environment to understand how colonialism, systemic racism, social determinants of health and other sources of inequity have and continue to underpin the healthcare context. Consequently, physicians then can recognise their interfacing with, and contribution to, the environment in which they work to advocate for safe, more equitable and decolonised services and create an inclusive and safe workplace for all colleagues and team members of all cultural backgrounds[3].

Critical reflection. Engage in iterative and critical self-reflection and demonstrate cultural safety in the context of their own cultural identity, power, biases, prejudices and practising behaviours.
Allyship. Recognise the patient and population's rights to culturally-safe care, including being an ally for patient, family, whānau and/or community autonomy and agency over their decision-making.
Inclusive communication. Apply culturally-safe communication, acknowledging the sharing of power, and cultural and human rights to enable patients, families and whānau to engage in appropriate patient care decisions.
Culturally-safe environment. Contributes to a culturally-safe learning and practice environment for patients and team members. Respect patients may feel unsafe in the healthcare environment.

[3] The RACP has adopted the Medical Council of New Zealand's definition of cultural safety (below): Cultural safety can be defined as:

- the need for doctors to examine themselves and the potential impact of their own culture on clinical interactions and healthcare service delivery
- the commitment by individual doctors to acknowledge and address any of their own biases, attitudes, assumptions, stereotypes, prejudices, structures, and characteristics that may affect the quality of care provided
- the awareness that cultural safety encompasses a critical consciousness where health professionals and health care organisations engage in ongoing self-reflection and self-awareness, and hold themselves accountable for providing culturally safe care, as defined by the patient and their communities.

Curtis et al. "Why cultural safety rather than cultural competency is required to achieve health equity". International Journal for Equity in Health (2019) 18:174

Ethics and professional behaviour

Professional standard: Physicians' practice is founded upon ethics, and physicians always treat patients, their families, communities, and populations in a caring and respectful manner.

Physicians demonstrate their commitment and accountability to the health and wellbeing of individual patients, communities, populations, and society through ethical practice.

Physicians demonstrate high standards of personal behaviour.

Beliefs and attitudes: Reflect critically on personal beliefs and attitudes, including how these may impact on patient care.
Honesty and openness: Act honestly, including reporting accurately, and acknowledging their own errors.
Patient welfare: Prioritise patients' welfare and community benefit above self-interest.
Accountability: Be personally and socially accountable.
Personal limits: Practise within their own limits and according to ethical principles and professional guidelines.
Self-care: Implement strategies to maintain personal health and wellbeing.
Respect for peers: Recognise and respect the personal and professional integrity, roles, and contribution of peers.
Interaction with professionals: Interact equitably, collaboratively, and respectfully with other health professionals.
Respect and sensitivity: Respect patients, maintain appropriate relationships, and behave equitably.
Privacy and confidentiality: Protect and uphold patients' rights to privacy and confidentiality.
Compassion and empathy: Demonstrate a caring attitude towards patients and endeavour to understand patients' values and beliefs.
Health needs: Understand and address patients', families', carers', and colleagues' physical and emotional health needs.
Medical and health ethics and law: Practise according to current community and professional ethical standards and legal requirements.

Judgement and decision making

Professional standard: Physicians collect and interpret information, and evaluate and synthesise evidence, to make the best possible decisions in their practice.

Physicians negotiate, implement, and review their decisions and recommendations with patients, their families and carers, and other health professionals.

Diagnostic reasoning: Apply sound diagnostic reasoning to clinical problems to make logical and safe clinical decisions.

Resource allocation: Apply judicious and cost-effective use of health resources to their practice.

Task delegation: Apply good judgement and decision making to the delegation of tasks.

Limits of practice: Recognise their own scope of practice and consult others when required.

Shared decision making: Contribute effectively to team-based decision-making processes.

Leadership, management, and teamwork

Professional standard: Physicians recognise, respect, and aim to develop the skills of others, and engage collaboratively to achieve optimal outcomes for patients and populations.

Physicians contribute to and make decisions about policy, protocols, and resource allocation at personal, professional, organisational, and societal levels.

Physicians work effectively in diverse multidisciplinary teams and promote a safe, productive, and respectful work environment that is free from discrimination, bullying, and harassment.

Managing others: Lead teams, including setting directions, resolving conflicts, and managing individuals.

Wellbeing: Consider and work to ensure the health and safety of colleagues and other health professionals.

Leadership: Act as a role model and leader in professional practice.

Teamwork: Negotiate responsibilities within the healthcare team and function as an effective team member.

Health policy, systems, and advocacy

Professional standard: Physicians apply their knowledge of the nature and attributes of local, national, and global health systems to their own practices. They identify, evaluate, and influence health determinants through local, national, and international policy.

Physicians deliver and advocate for the best health outcomes for all patients and populations.

Health needs: Respond to the health needs of the local community and the broader health needs of the people of Australia and Aotearoa New Zealand.

Prevention and promotion: Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients and their social support networks.

Equity and access: Work with patients and social support networks to address determinants of health that affect them and their access to needed health services or resources.

Stakeholder engagement: Involve communities and patient groups in decisions that affect them to identify priority problems and solutions.

Advocacy: Advocate for prevention, promotion, equity, and access to support patient and population health needs within and outside the clinical environment.

Resource allocation: Understand the factors influencing resource allocation, promote efficiencies, and advocate to reduce inequities.

Sustainability: Manage the use of health care resources responsibly in everyday practice.

Entrustable Professional Activities

Entrustable Professional Activities outline the essential work tasks trainees need to be able to perform in the workplace.

#	Theme	Title
2	Team leadership	Lead a team of health professionals
3	Supervision and teaching	Supervise and teach professional colleagues
4	Quality improvement	Identify and address failures in health care delivery
5	Clinical assessment and management	Clinically assess and manage the ongoing care of patients
6	Management of transitions from paediatric to adult care	Manage transitions of patient care from paediatric to adult medicine
7	Acute care	Manage the early care of acutely unwell patients
8	Longitudinal care	Manage and coordinate the longitudinal care of patients with chronic illness, disability, and/or long-term health issues
9	Communication with patients	Discuss diagnoses and management plans with patients, families, and/or carers
10	Prescribing	Prescribe therapies tailored to patients' needs and conditions
11	Investigations and procedures	Select, organise, and interpret investigations, and plan, prepare for, perform, and provide aftercare for important practical procedures
12	Clinic management	Manage an outpatient clinic

Learning goal 2: Team leadership

Theme	Team leadership	
Title	**Lead a team of health professionals**	
Description	This activity requires the ability to: • prioritise workload • manage multiple concurrent tasks • articulate individual responsibilities, expertise, and accountability of team members • understand the range of team members' skills, expertise, and roles • acquire and apply leadership techniques in daily practice • collaborate with and motivate team members • encourage and adopt insights from team members • act as a role model	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• synthesise information with other disciplines to develop optimal, goal-centred plans for patients[4] • use evidence-based care to meet the needs of patients or populations • assess and effectively manage clinical risk in various scenarios • demonstrate clinical competence and skills by effectively supporting team members	• demonstrate adequate knowledge of health care issues by interpreting complex information • assess the spectrum of problems to be addressed • apply medical knowledge to assess the impact and clinical outcomes of management decisions • provide coordinated and quality health care for populations or patients as a member of a multidisciplinary team
Communication	• provide support and motivate patients or populations and health professionals by effective communication • demonstrate a transparent, consultative style by engaging patients, families, carers, relevant professionals, and/or the public in shared decision making • work with patients and other health professionals to resolve conflict that may arise when planning and aligning goals • demonstrate rapport with people at all levels by tailoring messages to different stakeholders	• communicate adequately with colleagues • communicate adequately with patients and the public • respect the roles of team members

[4] References to patients in the remainder of this document may include their families, whānau and/or carers.

Quality and safety	• identify opportunities to improve care by participating in surveillance and monitoring of adverse events and 'near misses' • identify activities within systems to reduce errors, improve patient and population safety, and implement cost-effective change • place safety and quality of care first in all decision making	• participate in audits and other activities that affect the quality and safety of patients' care • participate in interdisciplinary collaboration to provide effective health services and operational change • use information resources and electronic medical record technology where available
Teaching and learning	• regularly self-evaluate personal professional practice, and implement changes based on the results • actively seek feedback from supervisors and colleagues on own performance • identify personal gaps in skills and knowledge, and engage in self-directed learning • maintain current knowledge of new technologies, health care priorities, and changes of patients' expectations • teach competently by imparting professional knowledge • manage and monitor learner progress, providing regular assessment and feedback	• accept feedback constructively, and change behaviour in response • recognise the limits of personal expertise, and involve other health professionals as needed • demonstrate basic skills in facilitating colleagues' learning
Cultural safety	• demonstrate culturally safe relationships with professional colleagues and patients • demonstrate respect for diversity and difference • take steps to minimise unconscious bias, including the impact of gender, religion, cultural beliefs, and socioeconomic background on decision making	• demonstrate awareness of cultural diversity and unconscious bias • work effectively and respectfully with people from different cultural backgrounds •
Ethics and professional behaviour	• promote a team culture of shared accountability for decisions and outcomes • encourage open discussion of ethical and clinical concerns • respect differences of multidisciplinary team members • understand the ethics of resource allocation by aligning optimal patients and organisational care • effectively consult with stakeholders, achieving a balance of alternative views • acknowledge personal conflicts of interest and unconscious bias • act collaboratively to resolve behavioural incidents and conflicts such as harassment and bullying	• support ethical principles in clinical decision making • maintain standards of medical practice by recognising the health interests of patients or populations as primary responsibilities • respect the roles and expertise of other health professionals • work effectively as a member of a team • promote team values of honesty, discipline, and commitment to continuous improvement • demonstrate an understanding of the negative impact of workplace conflict

Judgement and decision making	• evaluate health services and clarify expectations to support systematic, transparent decision making • make decisions when faced with multiple and conflicting perspectives • ensure medical input to organisational decision making • adopt a systematic approach to analysing information from a variety of specialties to make decisions that benefit health care delivery	• monitor services and provide appropriate advice • review new health care interventions and resources • interpret appropriate data and evidence for decision making
Leadership, management, and teamwork	• combine team members' skills and expertise in delivering patient care and/or population advice • develop and lead effective multidisciplinary teams by developing and implementing strategies to motivate others • build effective relationships with multidisciplinary team members to achieve optimal outcomes • ensure all members of the team are accountable for their individual practice	• understand the range of personal and other team members' skills, expertise, and roles • acknowledge and respect the contribution of all health professionals involved in patients' care • participate effectively and appropriately in multidisciplinary teams • seek out and respect the perspectives of multidisciplinary team members when making decisions
Health policy, systems, and advocacy	• engage in appropriate consultation with stakeholders on the delivery of healthcare • advocate for the resources and support of health care teams to achieve organisational priorities • influence the development of organisational policies and procedures to optimise health outcomes • identify the determinants of health of the population, and mitigate barriers to access to care • remove self-interest from solutions to health advocacy issues	• communicate with stakeholders within the organisation about health care delivery • understand methods used to allocate resources to provide high-quality care • promote the development and use of organisational policies and procedures

Learning goal 3: Supervision and teaching

Theme	Supervision and teaching	
Title	**Supervise and teach professional colleagues**	
Description	This activity requires the ability to: • provide work-based teaching in a variety of settings • teach professional skills • create a safe and supportive learning environment • plan, deliver, and provide work-based assessments • encourage learners to be self-directed and identify learning experiences • supervise learners in day-to-day work, and provide feedback • support learners to prepare for assessments	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• combine high-quality care with high-quality teaching • explain the rationale underpinning a structured approach to decision making • consider the patient-centric view during consultations • consider the population health effect when giving advice • encourage the learner to consider the rationale and appropriateness of investigation and management options	• teach learners using basic knowledge and skills
Communication	• establish rapport and demonstrate respect for junior colleagues, medical students, and other health professionals • communicate effectively when teaching, assessing, and appraising learners • actively encourage a collaborative and safe learning environment with learners and other health professionals • encourage learners to tailor communication as appropriate for different patients, such as younger or older people, and different populations • listen and convey information clearly and considerately • support learners to deliver clear, concise, and relevant information in both verbal and written communication	• demonstrate accessible, supportive, and compassionate behaviour

Quality and safety	• support learners to deliver quality care while maintaining their own wellbeing • apply lessons learned about patient safety by identifying and discussing risks with learners • assess learners' competence, and provide timely feedback to minimise risks to care • maintain the safety of patients and organisations involved with education, and appropriately identify and action concerns, including the involvement of senior team members if necessary	• observe learners to reduce risks and improve health outcomes • identify and participate in new learning experiences which build skills
Teaching and learning	• demonstrate knowledge of the principles, processes, and skills of supervision • provide direct guidance to learners in day-to-day work • work with learners to identify professional development and learning opportunities, based on their individual learning needs • offer feedback and role modelling • participate in teaching and supervision professional development activities • encourage self-directed learning and assessments • develop a consistent and fair approach to assessing learners • tailor feedback and assessments to learners' goals • seek feedback and reflect on own teaching by developing goals and strategies to improve • establish and maintain effective mentoring through open dialogue • support learners to identify and attend formal and informal learning opportunities • recognise the limits of personal expertise, and involve others appropriately	• demonstrate basic skills in the supervision of learners • apply a standardised approach to teaching, assessment, and feedback without considering individual learner needs • implement teaching and learning activities that are misaligned to learning goals • adopt a teaching style that discourages learners' self-directedness
Research	• clarify junior colleagues' research project goals and requirements, and provide feedback regarding the merits or challenges of proposed research • support learners to find forums to present research projects • monitor the progress of learners' research projects regularly, and may review research projects prior to submission • encourage and guide learners to seek out relevant research to support practice	• guide learners with respect to the choice of research projects • ensure that planned research projects are feasible and of suitable standards

Cultural safety	• role model a culturally safe approach to teaching • encourage learners to seek out opportunities to develop and improve their own cultural competence • encourage learners to consider culturally appropriate care of Māori and Aboriginal and Torres Strait Islander peoples into patients' management • consider cultural, ethical, and religious values and beliefs in teaching and learning	• function effectively and respectfully when working with and teaching with people from different cultural backgrounds
Ethics and professional behaviour	• apply principles of ethical practice to teaching scenarios • act as a role model to promote professional responsibility and ethics among learners • respond appropriately to learners seeking professional guidance	• demonstrate professional values, including commitment to high-quality clinical standards, compassion, empathy, and respect • provide learners with feedback to improve their experiences
Judgement and decision making	• prioritise workloads and manage learners with different levels of professional knowledge or experience • link theory and practice when explaining professional decisions • promote joint problem solving • support a learning environment that allows for independent decision making • use sound and evidence-based judgement during assessments and when giving feedback to learners • escalate concerns about learners appropriately	• provide general advice and support to learners • use health data logically and effectively to investigate difficult diagnostic problems
Leadership, management, and teamwork	• maintain personal and learners' effective performance and continuing professional development • maintain professional, clinical, research, and/or administrative responsibilities while teaching • help shape organisational culture to prioritise quality and work safety through openness, honesty, shared learning, and continued improvement • create an inclusive environment whereby learners feel part of the team	• demonstrate the principles and practice of professionalism and leadership in health care • participate in mentor programs, career advice, and general counselling
Health policy, systems, and advocacy	• advocate for suitable resources to provide quality supervision and maintain training standards • explain the value of health data in the care of patients or populations	• incompletely integrate public health principals into teaching and practice

	• support innovation in teaching and training

Learning goal 4: Quality improvement

Theme	Quality improvement	
Title	**Identify and address failures in health care delivery**	
Description	This activity requires the ability to: • identify and report actual and potential ('near miss') errors • conduct and evaluate system improvement activities • demonstrate the application of best practice guidelines • audit clinical outcomes, and implement clinical guidelines where applicable • contribute to the development of policies and protocols designed to protect patients and enhance health care • monitor one's own practice, and develop individual improvement plans • participate in clinical review meetings and review systems to prevent adverse patient outcomes	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• regularly review patients • evaluate practice to ensure it aligns with available evidence and guidelines • recognise the complex care needs of patients living with chronic endocrine conditions, and proactively institute care planning to mitigate acute deterioration • use population health outcomes to identify opportunities for improvement in delivering appropriate care • regularly review patients' or population health outcomes to identify opportunities for improvement in delivering appropriate care • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • use standardised protocols to adhere to best practice and prevent the occurrence of wrong-site, wrong-patient procedures • regularly monitor personal professional performance	• contribute to processes on identified opportunities for improvement • recognise the importance of prevention and early detection in clinical practice • use local guidelines to assist patient care decision making
Communication	• support patients to have access to, and use, easy-to-understand, high-quality information about health care	• demonstrate awareness of the evidence for consumer engagement and its contribution to quality improvement in health care

	• support patients to share decision making about their own health care, to the extent they choose • direct patients on processes for accessing their own health information, as well as complaint and feedback systems • discuss with patients any safety and quality concerns they have relating to their care • assist patients to understand about hospital open disclosure policy • implement the organisation's open disclosure policy	• apply knowledge of how health literacy might affect the way patients or populations gain access to, understand, and use health information
Quality and safety	• demonstrate safety skills, including infection control, adverse event reporting, and effective clinical handover • participate in organisational quality and safety activities, including morbidity and mortality reviews, clinical incident reviews, root cause analyses, and corrective action preventative action plans • participate in systems for surveillance and monitoring of quality care, adverse events and 'near misses', including reporting such events • ensure that identified opportunities for improvement are raised and reported appropriately • use clinical audits and registries of data on patients' experiences and outcomes, learnings from incidents, and complaints to improve healthcare	• demonstrate an understanding of a systematic approach to improving the quality and safety of health care • demonstrate understanding of the principles of organisational quality and safety activities, including root cause analyses and corrective and preventive action plans
Teaching and learning	• translate quality improvement approaches and methods into practice • participate in professional training in quality and safety to ensure a contemporary approach to safety system strategies • supervise and manage the performance of junior colleagues in the delivery of high-quality, safe care • maintain continuing professional development obligations as per regulatory requirements	• work within organisational quality and safety systems for the delivery of clinical care • use opportunities to learn about safety and quality theory and systems
Research	• apply the principles which underpin ethical research • understand the processes for obtaining research ethics approval within an organisation • ensure that any protocol for human research is approved by a human research ethics committee, in	• understand that patient participation in research is voluntary and based on an appropriate understanding about the purpose, methods, demands, risks, and potential benefits of the research

	accordance with the national statement on ethical conduct in human research • ensure research adherence to the local and national codes for the responsible conduct of research[5] • communicate to the patient that they will not be treated differently should they opt to not participate in research • engage in collaborative and ethical research practice with all stakeholders, and acknowledge own and others' contributions to research • ensure research is conducted in accordance with "Good Clinical Practice"	
Cultural safety	• communicate effectively with patients from culturally and linguistically diverse backgrounds, including through effective collaboration with interpreters • undertake professional development opportunities that address the impact of cultural bias on health outcomes	• communicate effectively with patients from culturally and linguistically diverse backgrounds
Ethics and professional behaviour	• align improvement goals with the priorities of the organisation • contribute to developing an organisational culture that enables and prioritises patients' safety and quality of care	• comply with professional regulatory requirements and codes of conduct
Judgement and decision making	• use decision-making support tools, such as guidelines, protocols, pathways, and reminders • analyse and evaluate current care processes to improve health care	• access information and advice from other health practitioners to identify, evaluate, and improve patients' care management
Leadership, management, and teamwork	• formulate and implement quality improvement strategies as a collaborative effort involving all key health professionals • support multidisciplinary team activities, and promote interdisciplinary programs of education to lower patients' risk of harm • actively involve clinical pharmacists in the medication-use process	• demonstrate attitudes of respect and cooperation among members of different professional teams • partner with clinicians and managers to ensure patients receive appropriate care and information on their care

[5] NHMRC code: nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018 or the Australian clinical trials code: australianclinicaltrials.gov.au/researchers/good-clinical-practice-gcp-australia

Health policy, systems, and advocacy	• participate in all aspects of the development, implementation, evaluation, and monitoring of governance processes • participate regularly in multidisciplinary meetings where quality and safety issues are standing agenda items, and where innovative ideas and projects for improving care are actively encouraged • measure, analyse, and report a set of specialty-specific process of care and outcome clinical indicators, and a set of generic safety indicators • take part in the design and implementation of the organisational systems for: • clinical, and safety and quality education and training • defining the scope of clinical practice • performance monitoring and management	• maintain a dialogue with service managers about issues that affect patient care • contribute to relevant organisational policies and procedures • help shape an organisational culture that prioritises safety and quality through openness, honesty, learning, and quality improvement

Learning goal 5: Clinical assessment and management

Theme	Clinical assessment and management	
Title	**Clinically assess and manage the ongoing care of patients**	
Description	This activity requires the ability to: • identify and access sources of relevant information about patients • obtain histories from families and/or carers, and, if age appropriate, patients themselves • examine patients • synthesise findings to develop provisional and differential diagnoses • discuss findings with patients, families, and/or carers • generate management plans • present findings to other health professionals	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• assess, investigate, manage, and treat common and less common endocrine presentations and syndromes • elicit an accurate, organised, and problem-focused medical history considering physical, psychosocial, and risk factors • perform a full physical examination to establish the nature and extent of problems • synthesise and interpret findings from the history and examination to devise the most likely provisional diagnoses via reasonable differential diagnoses • when necessary, arrange appropriate investigations to assist in diagnostic work ups • assess the severity of conditions, the likelihood of complications, and possible clinical outcomes • develop management plans based on relevant information, integrated with guidelines, and consider the balance of benefit and harm by taking patients' personal sets of circumstances into account • identify areas where patients and families may require further support	• take patient-centred histories, considering psychosocial factors • perform accurate physical examinations • recognise and correctly interpret abnormal findings • synthesise pertinent information to direct the clinical encounter and diagnostic categories • develop appropriate management plans

	• consider age, chronic disease status, lifestyle factors, allergies, potential drug interactions or adverse events, and patients' preferences prior to prescribing new medications • plan follow up and monitoring at appropriate intervals	
Communication	• communicate openly, listen, and take carers and patients' concerns seriously, giving them adequate opportunity to ask questions • provide developmentally appropriate information to patients to enable them to make fully informed decisions from various diagnostic, therapeutic, and management options • communicate clearly, effectively, respectfully, and promptly with other health professionals involved in patients' care, including in written correspondence, medical records and verbal communications • use age-appropriate communication skills with patients, considering both family and/or carers' wishes and patients' autonomy when discussing medical information	• anticipate, read, and respond to verbal and nonverbal cues • demonstrate active listening skills • communicate patients' situations to colleagues, including senior clinicians • document clinical encounters to convey clinical reasoning and the rationale for decisions • arrange investigations, providing accurate and informative referrals, and liaising with other services where appropriate •
Quality and safety	• demonstrate safety skills, including infection control, adverse event reporting, and effective clinical handover • recognise and effectively deal with aggressive and violent patient behaviors through appropriate training • obtain informed consent before undertaking any investigation or providing treatment (except in emergencies) • ensure patients are informed of the material risks associated with any part of proposed management plans • outline risk mitigation strategies for patients living with chronic endocrine conditions who are at risk of acute deterioration	• perform hand hygiene, and take infection control precautions at appropriate moments • take precaution against assaults from patients and/or families, while still ensuring appropriate care of patients • document history and physical examination findings, and synthesise with clarity and completeness
Teaching and learning	• set defined objectives for clinical teaching encounters, and solicit feedback on mutually agreed goals • regularly reflect upon and self-evaluate professional development	• need assistance to set goals and clear objectives for self-learning • engage in self-reflection, and require encouragement to do this more frequently • deliver teaching considering learners' levels of training

	• obtain informed consent before involving patients in teaching activities • turn clinical activities into an opportunity to teach, appropriate to the setting	
Research	• search for, find, compile, analyse, interpret, and evaluate information relevant to the research subject • use relevant resources to assist with resolving clinical problems, including practice guidelines and current literature	• refer to guidelines and medical literature to assist in clinical assessments when required • demonstrate an understanding of the limitations of evidence and the challenges of applying research in daily practice
Cultural safety	• use plain-language patient education materials, and demonstrate cultural and linguistical sensitivity • demonstrate effective and culturally safe communication and care for Māori and Aboriginal and Torres Strait Islander peoples, and members of other cultural groups • use a professional interpreter, health advocate, or a family or community member to assist in communication with patients, and understand the potential limitations of each • acknowledge patients', families' and/or carers' beliefs and values, and how these might impact on health	• display respect for patients', families', and/or carers' cultures, and attentiveness to social determinants of health • display an understanding of at least the most prevalent cultures in society, and an appreciation of their sensitivities • appropriately access interpretive or culturally focused services
Ethics and professional behaviour	• demonstrate professional values, including compassion, empathy, respect for diversity, integrity, honesty, and partnership to all patients • hold information about patients in confidence, unless the release of information is required by law or public interest • assess patients' capacity for decision making, involving family or carers appropriately • recognise the limits of parents' ability to consent • demonstrate an understanding of the ethical implications of pharmaceutical industry marketing and funded research • not advance personal interest or professional agendas at the expense of patient or social welfare	• demonstrate professional conduct, honesty, and integrity • consider patients' decision-making capacity • identify patients' preferences regarding management and the role of families in decision making • follow organisational policies on pharmaceutical representative visits and drug marketing
Judgement and decision making	• apply knowledge and experience to identify patients' problems, making logical, rational decisions,	• demonstrate clinical reasoning by gathering focused information relevant to patients' care

	and acting to achieve positive outcomes for patients • use a holistic approach to health considering comorbidity, uncertainty, and risk • use the best available evidence for the most effective therapies and interventions to ensure quality care	• recognise personal limitations, and seek help in an appropriate way when required
Leadership, management, and teamwork	• work effectively as a member of multidisciplinary teams to achieve the best health outcome for patients • demonstrate awareness of colleagues in difficulty, and work within the appropriate structural systems to support them while maintaining patient safety	• share relevant information with members of the health care team
Health policy, systems, and advocacy	• participate in health promotion, disease prevention and control, screening, and reporting notifiable diseases • aim to achieve the optimal cost-effective patient care to allow maximum benefit from the available resources	• identify and navigate components of the healthcare system relevant to patients' care • identify and access relevant community resources to support patient care

Learning goal 6: Management of transitions from paediatric to adult care

Theme	**Management of transitions from paediatric to adult care**
Title	**Manage transitions of patient care from paediatric to adult medicine**
Description	This activity requires the ability to: • assess the timing and risks in transition from paediatric to adult care • assess patients', families', and/or carers' readiness for transition to adult care • create goals of transition in care specific to patients and their care needs • develop a transition plan in collaboration with patients, family, and/or carers, and the medical team • summarise and document the clinical case for handover to the adult endocrinologist

Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• assess patients' health literacy and developmental readiness for the demands of the adult care setting • assess adherence to treatment and monitoring plans • outline the key components of a transition program and the differences between the cultures of paediatric and adult care services, including the role of the adult physician • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • anticipate, prevent, and manage changes in health status at the time of transition • adapt transition to meet individual patients' needs • identify youth-focused adult services and local transition coordinators / facilitators	• recognise the importance of maintaining continuity of care and prevention of loss to follow up at the time of transition • assess psychosocial issues that may affect health and/or access to services • identify the ways in which disease may impact on patients' lifestyles, such as contraception, pregnancies, employment, sport / leisure activities, and smoking • establish plans for ongoing care that include monitoring health status and managing adherence
Communication	• explain the impact of an endocrine disorder on adolescents' and young adults' leisure and work activities • explain confidentiality to the young person • adopt a developmentally appropriate approach to transition, and assess patients' understanding of their illness and health care needs, and work with them to increase their understanding	• perform appropriate psychosocial and mental health assessments using recognised tools • use communication skills and strategies that help patients make informed decisions • recognise and explore the worries and concerns of adolescent patients and their family and/or carers • communicate sensitively with adolescents and young adults • recognise when it is appropriate to communicate with patients individually versus when it is appropriate to

	• identify the need to shift responsibility for decision making from parents or carers to patients, and work with parents or carers and patients on planning this • ensure all members of the multidisciplinary team contribute to transition plans • ensure communication regarding transition includes the general practitioner and all current care providers	communicate with patients and their family members and/or carers • discuss with patients the differences between paediatric and adult care, such as the involvement of the parent or carer in decisions for adult patients versus paediatric patients
Quality and safety	• ensure patients are informed of risks associated with any part of proposed management plans • use of "Transition readiness checklist" to assess preparedness of young person for transition	• document patients' histories with clarity and completeness
Teaching and learning	• educate adolescents and young adults about their conditions and their impacts on their lives	• explain how patient education can empower young adults to take responsibility for their health • ensure the young person understands and has a sick day management plan, and knows who to contact during the transition process
Cultural safety		• discuss topics including sexuality and contraception sensitively, and consider the cultural and religious beliefs of patients and their families
Ethics and professional behaviour	• explain the role of GPs in patients' care, including relevant guidelines and how they apply • explain confidentiality and what this means for young people and their family and/or carers • recognise legal issues around consent and assessment of capacity and competence	
Judgement and decision making	• identify the right time to start facilitating transition by considering the needs of individual patients, and discuss this with the patient • select the appropriate specialist to transition the patient, taking into account the availability of youth-orientated services	• consider whether a paediatric or adult setting may be more appropriate to conduct procedures and/or investigations • communicate with the GP regarding transition
Leadership, management, and teamwork	• ensure sufficient handover, including robust notes to convey complex history and/or rationale for past decisions • consider the timing of transition in relation to other specialties in which the patient is receiving care	• recognise the importance of, and integrate with, the multidisciplinary team in the management of adolescents and young adults • recognise and work collaboratively with other health care providers, including allied health workers and psychologists

Health policy, systems, and advocacy	• connect patients with local or online peer support groups • contribute to the development of a written transition policy, which is a document that sets out principles, standards, and practices of how transitions are managed at the centre • advocate for resources to support efficient and more effective transitions	• apply local and international guidelines around transitions

Learning goal 7: Acute care

Theme	Acute care	
Title	**Manage the early care of acutely unwell patients**	
Description	This activity requires the ability to: • assess seriously unwell or injured patients, and initiate evidence-based, safe management • recognise clinical deterioration, and respond by following the local process for escalation of care • recognise and manage acutely unwell patients who require resuscitation • lead the resuscitation team initially, and involve other necessary services • liaise with transport services and medical teams • perform this activity primarily in inpatient settings	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• recognise immediate life-threatening conditions and deteriorating and critically unwell patients, and respond appropriately, including escalation to high acuity care and administration of appropriate initial treatment • perform advanced life support, according to resuscitation council guidelines, to a high level of advanced resuscitation skills (e.g., Advanced Paediatric Life Support) • demonstrate knowledge of potential risks and complications of resuscitation • identify possible diagnoses that may threaten patients' safety, and investigate appropriately to confirm or exclude • systematically identify causes of acute deterioration in health status and levels of physical and cognitive functioning • manage escalations or transitions of care in a proactive and timely manner • use hospital protocols for acute endocrine emergencies, and be able to clearly explain when variations from these are necessary • develop plans of multidisciplinary treatment, rehabilitation, and	• recognise seriously unwell patients requiring immediate care • apply basic life support as indicated • understand general medical principles of caring for patients with undifferentiated and undiagnosed conditions • identify potential causes of current deterioration, and comply with escalation protocols • facilitate initial tests to assist in diagnosis, and develop management plans for immediate treatment • document information to outline the rationale for clinical decisions and action plans • assess perioperative and periprocedural patients • manage most acute conditions independently, but be aware of own limitations and escalate to consultants as appropriate

	secondary prevention following acute events • provide clear and effective discharge summaries, with recommendations for ongoing care • optimise medical management before, during, and after operations, procedures, or hospital admissions	
Communication	• communicate clearly with other team members, and coordinate efforts of multidisciplinary team members • convey information to other medical professionals involved • in patients' care, including ICU, retrieval services, and other medical teams • support health professionals • in remote settings to manage acutely unwell patients • use closed-loop and clear communication with other health care team members during resuscitation • relay patients' presentation, care, progress, and management plans to colleagues factually, clearly, succinctly, and with prioritised clinical information • facilitate early communication with patients, families, and health professionals to allow shared decision making • negotiate realistic treatment goals, and determine and explain expected prognoses and outcomes • employ communication strategies appropriate for younger patients or those with cognitive difficulties • explain the situation to patients in a sensitive and supportive manner, avoiding jargon and confirming their understanding • determine the level of health literacy of individual patients and level of understanding of agreed care decisions	• demonstrate communication skills to sufficiently support the function of multidisciplinary teams • determine patients' understanding of their diseases and what they perceive as the most desirable goals of care
Quality and safety	• maintain up-to-date certification in advanced life support • use clinical information technology systems for conducting prospective and retrospective clinical audits • evaluate and explain the benefits and risks of clinical interventions based on individual patients' circumstances	• evaluate the quality of processes through well-designed audits • recognise the risks and benefits of all interventions • raise appropriate issues for review at morbidity and mortality meetings • evaluate the quality and safety processes implemented within the workplace, and identify gaps in their structure

	• analyse adverse incidents and sentinel events to identify system failures and contributing factors • identify evidence-based practice gaps using clinical indicators, and implement changes to improve patients' outcomes • coordinate and encourage innovation, and objectively evaluate improvement initiatives for outcomes and sustainability • consider alternative strategies • if complications arise or treatment is ineffective • participate in organisational quality and safety activities, including morbidity and mortality reviews and clinical incident reviews • document treatment given without consent in an emergency according to local guidelines	
Teaching and learning	• demonstrate effective supervision skills and teaching methods which are adapted to the context of the training • encourage questioning among junior colleagues and students in response to unanswered clinical questions • seek guidance and feedback from health care teams to reflect on encounters and improve future patients' care • regularly reflect and self-evaluate professional development • obtain informed consent before turning clinical activities into teaching opportunities, ensuring patients are aware of the risks	• mentor and train others to enhance team effectiveness • provide constructive feedback to junior colleagues to contribute to improvements in individuals' skills • coordinate and supervise junior colleagues from the emergency department and the wards
Research	• select studies based on optimal trial design, freedom from bias, and precision of measurement, and apply to clinical practice as appropriate • evaluate the value of treatments in terms of relative and absolute benefits, costs, potential patient harm, and feasibility • evaluate the applicability of the results of clinical studies to the circumstances of individual patients, especially those with multiple comorbidities • specify research evidence to the needs of individual patients	• demonstrate efficient searching of literature databases to retrieve evidence • use information from credible sources to aid in decision making • refer to evidence-based clinical guidelines and protocols on acutely unwell patients • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• negotiate health care decisions in a culturally safe way by considering variation in family	• practise cultural competency appropriate for the community serviced

	structures, cultures, religion, or belief systems • integrate culturally safe care of Māori and Aboriginal and Torres Strait Islander peoples into patients' management • consider cultural, ethical, and religious values and beliefs in leading multidisciplinary teams	• proactively identify barriers to access to health care
Ethics and professional behaviour	• develop management plans that are based on medical assessments of the clinical conditions and multidisciplinary assessments of functional capacity • advise patients of their rights to refuse medical therapy, including life-sustaining treatment • consider the consequences of delivering treatment that is deemed futile, directing to other care as appropriate • facilitate interactions within multidisciplinary teams, respecting values, encouraging involvement, and engaging all participants in decision making • demonstrate critical reflection on personal beliefs and attitudes, including how these may affect patient care and health care policy	• communicate medical management plans as part of multidisciplinary plans • establish, where possible, patients' wishes and preferences about care • contribute to building a productive culture within teams
Judgement and decision making	• recognise the need for escalation of care, and escalate to appropriate staff or services • integrate evidence related to questions of diagnosis, therapy, prognosis, risks, and cause into clinical decision making • reconcile conflicting advice from other specialties, applying judgement in making clinical decisions in the presence of uncertainty • use care pathways effectively, including identifying reasons for variations in care	• involve additional staff to assist in a timely fashion when required • recognise personal limitations, and seek help in an appropriate way when required
Leadership, management, and teamwork	• work collaboratively with staff in the emergency department, intensive care, and other subspecialty inpatient units • lead a team by providing engagement while maintaining a focus on outcomes • manage the transition of acute medical patients through their hospital journey, including appropriate handover on discharge to community health professionals • manage and initiate open disclosure as necessary	• collaborate with and engage other team members, based on their roles and skills • encourage an environment of openness and respect to lead effective teams • ensure appropriate multidisciplinary assessment and management

Health policy, systems, and advocacy	• use a considered and rational approach to the responsible use of resources, balancing costs against outcomes • prioritise patient care based on need, and consider available health care resources • collaborate with emergency medicine staff and other colleagues to develop policies and protocols for the investigation and management of common acute medical problems	• understand the systems for the escalation of care for deteriorating patients • understand the role of clinician leadership and advocacy in appraising and redesigning systems of care that lead to better patient outcomes

Learning goal 8: Longitudinal care

Theme	Longitudinal care	
Title	**Manage and coordinate the longitudinal care of patients with chronic illness, disability, and/or long-term health issues**	
Description	This activity requires the ability to: • develop management plans and goals in consultation with patients, families, and/or carers • manage chronic and advanced conditions, complications, disabilities, and comorbidities • collaborate with other health care providers • ensure continuity of care • facilitate patients' self-management and self-monitoring • engage with the broader health policy context	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• regularly assess and review care plans for patients with chronic conditions and disabilities based on short- and long-term clinical and quality of life goals • provide documentation on patients' presentation, management, and progress, including key points of diagnosis and decision making to inform coordination of care • ensure patients contribute to their needs assessments and care planning • monitor treatment outcomes, effectiveness, and adverse events	• assess patients' knowledge, beliefs, concerns, and daily behaviours related to their chronic condition and/or disability and its management • contribute to medical record entries on histories, examinations, and management plans in a way that is accurate and sufficient as a member of multidisciplinary teams
Communication	• encourage patients' self-management through education to take greater responsibility for their care, and support problem solving • work in partnership with patients, and motivate them to adhere to agreed management plans • communicate with multidisciplinary team members, and involve patients in that dialogue • communicate with patients about transition of care, and engage and support them in decision making	• provide healthy lifestyle advice and information to patients on the importance of self-management • encourage patients' access to self-monitoring devices and assistive technologies
Quality and safety	• use innovative models of chronic disease care using telehealth and digitally integrated support services	• participate in continuous quality improvement processes and clinical audits on chronic disease management

	• review medicine use, and ensure patients understand safe medication administration to prevent errors • support patients' self-management by balancing between minimising risk and helping patients to become more independent • initiate and participate in quality improvement processes impacting on patients' abilities to undertake normal activities of daily living	• identify activities that may improve patients' quality of life
Teaching and learning	• contribute to the development of clinical pathways for chronic diseases management based on current clinical guidelines	• use clinical practice guidelines for chronic diseases management • educate patients to recognise and monitor their symptoms, and undertake strategies to assist their recovery • educate patients regarding sick day management plans for common and important endocrine conditions
Research	• prepare reviews of literature on patients' encounters to present at journal club meetings • search for and critically appraise evidence to resolve clinical areas of uncertainty • prepare research protocols to evaluate interventions and outcomes for chronic disease	• search literature using Problem / Intervention / Comparison / Outcome (PICO) format • recognise appropriate use and limitations of review articles
Cultural safety	• encourage patients from culturally and linguistically diverse backgrounds to join local networks to receive the support needed for long-term self-management	• provide culturally safe chronic disease management
Ethics and professional behaviour	• share information about patients' health care, consistent with privacy laws and confidentiality and professional guidelines • use consent processes for the release and exchange of health information • recognise patients' evolving decision-making capacity, and appropriately engage adolescents in decision making	• confidentially share information between relevant service providers • acknowledge and respect the contribution of other health professionals involved in patients' care • seek consent from patients to discuss their care at multidisciplinary clinical meetings
Judgement and decision making	• implement stepped care pathways in the management of chronic diseases and disabilities • recognise patients' needs in terms of both internal resources and external support on long-term health care journeys	• recognise personal limitations, and seek help in an appropriate way when required

Leadership, management, and teamwork	• coordinate whole-person care through involvement in all stages of patients' care journeys • use a multidisciplinary approach across services to manage patients with chronic diseases and disabilities • develop collaborative relationships with patients, families, carers, and a range of health professionals	• participate in multidisciplinary care for patients with chronic diseases and disabilities, including organisational and community care on a continuing basis, appropriate to patients' context
Health policy, systems, and advocacy	• use health screening for early intervention and chronic diseases management • assess alternative models of health care delivery to patients with chronic diseases and disabilities • participate in government initiatives for chronic diseases management to reduce hospital admissions and hospital-related complications and improve patients' quality of life • assist patients to access initiatives and services for patients with chronic diseases and disabilities	• demonstrate an awareness of government initiatives and services available for patients with chronic diseases and disabilities, and display knowledge of how to access them

Learning goal 9: Communication with patients

Theme	Communication with patients	
Title	**Discuss diagnoses and management plans with patients, families, and/or carers**	
Description	This activity requires the ability to: • select a suitable context and include family and/or carers and other team members • adopt a patient-centred perspective, including adjusting for age, cognition, and abilities • select and use appropriate modalities and communication strategies • structure conversations intentionally • negotiate mutually agreed management plans • verify patient, family, or carer understanding of information conveyed • develop and implement a plan for ensuring actions occur • ensure the conversation is documented	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• anticipate and be able to correct any misunderstandings patients may have about their conditions and/or risk factors • inform patients of all aspects of their clinical management, including assessments, investigations, and management recommendations • give patients adequate opportunity to question and/or decline interventions and treatments • seek to understand the concerns and goals of patients, and plan management in partnership with them • provide information to patients to enable them to make informed decisions about diagnostic, therapeutic, and management options • recognise when to refer patients to psychological support services	• apply knowledge of the scientific basis of health and disease to the management of patients • demonstrate an understanding of the clinical problem being discussed • formulate management plans in partnership with patients
Communication	• use an age-appropriate communication strategy and modalities for communication, such as written information, emails, face-to-face, or phone calls • elicit patients' views, concerns, and preferences, promoting rapport	• select appropriate modes of communication • engage patients in discussions, avoiding the use of jargon • check patients' understanding of information

	• provide information to patients in plain language, avoiding jargon, acronyms, and complex medical terms • encourage questions, and answer them thoroughly • ask patients to share their thoughts or explain their management plans in their own words, to verify understanding • convey information considerately and sensitively to patients, seeking clarification if unsure of how best to proceed • treat children and young people respectfully, and listen to their views • communicate with adolescents in an age-appropriate manner, acknowledging their developing autonomy • communicate with adolescents separately from family or carers as needed, ensuring confidentiality (when appropriate) and respect of their evolving capacity • set clear professional boundaries for communication with patients • explain diagnoses, incidental findings, management, and long-term impacts to parents and carers • explain the implications of different diagnoses and/or treatments for patients' current and future pregnancies • discuss options for pregnancies with endocrine disease sensitively with pregnant adolescents and their family or carers	• adapt communication style in response to patients' age, developmental level, and cognitive, physical, cultural, socioeconomic, and situational factors • collaborate with patient liaison officers as required
Quality and safety	• discuss with patients their condition and the available management options, including potential benefits and harms • provide information to patients in a way they can understand, before asking for their consent • consider young people's capacity for decision making and consent • recognise and take precautions where patients may be vulnerable, such as issues of child protection, family violence, or self-harm • participate in processes to manage patient complaints, and participate in open disclosure discussions with patients	• inform patients of the material risks associated with proposed management plans • treat information about patients as confidential, while still acknowledging the limitations of confidentiality in cases of harm to a child or adolescent

Teaching and learning	• discuss the aetiology of diseases, and explain the purpose, nature, and extent of the assessments to be conducted • obtain informed consent or other valid authority before involving patients in teaching • encourage questions and observations from junior staff and students to facilitate open communication and teaching • provide constructive feedback to junior colleagues to contribute to improvements in individuals' skills • engage with community organisations and public health channels to promote preventative and public health strategies in clear and relevant language • recognise the significance of role modelling all aspects of the work of a physician in interactions with junior staff and medical students, for their learning	• respond appropriately to information sourced by patients, and to patients' knowledge regarding their condition
Research	• provide information to patients that is based on guidelines • provide information to patients in a way they can understand before asking for their consent to participate in research • obtain an informed consent or other valid authority before involving patients in research	• refer to evidence-based clinical guidelines • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• demonstrate effective and culturally safe communication with Māori and Aboriginal and Torres Strait Islander peoples • effectively communicate with members of other cultural groups by meeting patients' specific language, cultural, and communication needs • use qualified language interpreters or cultural interpreters to help meet patients' communication needs • provide plain language and culturally appropriate written materials to patients when possible • respect patients' cultural views, and incorporate these when developing management plans where possible	• identify when to use interpreters • allow enough time for communication across linguistic and cultural barriers
Ethics and professional behaviour	• encourage and support patients to be well informed about their health, and to use this information wisely when they make decisions	• respect the preferences of patients • communicate appropriately, consistent with the context, and respect patients' needs and preferences

	• encourage and support patients in caring for themselves and managing their health • demonstrate respectful professional relationships with patients • identify when it is appropriate to communicate with the patient versus their family or carer • prioritise honesty, patients' welfare, and community benefit above self-interest • develop a high standard of personal conduct, consistent with professional and community expectations • support patients' rights to seek second opinions	• maximise patient autonomy, and support their decision making • avoid sexual, intimate, and/or financial relationships with patients • demonstrate a caring attitude towards patients • respect patients, including protecting their rights to privacy and confidentiality • behave equitably towards all, irrespective of gender, age, culture, socioeconomic status, sexual preferences, beliefs, contribution to society, illness-related behaviours, or the illness itself • use social media ethically and according to legal obligations to protect patients' confidentiality and privacy
Leadership, management, and teamwork	• communicate effectively with team members involved in patients' care, and with patients, families and/or carers • discuss medical assessments, treatment plans, and investigations with patients and primary care teams, working collaboratively with all • discuss patient care needs with health care team members to align them with the appropriate resources • facilitate an environment where all team members feel they can contribute and their opinion is valued • communicate accurately and succinctly, and motivate others on the health care team	• answer questions from team members • summarise, clarify, and communicate responsibilities of health care team members • keep health care team members focused on patient outcomes
Health policy, systems, and advocacy	• collaborate with other services, such as community health centres and consumer organisations, to help patients navigate the healthcare system • collaborate with public health organisations to promote preventative health information • advocate for appropriate immunisations and vaccines while maintaining respect for the views and wishes of individual patients	• communicate with and involve other health professionals as appropriate

Learning goal 10: Prescribing

Theme	Prescribing	
Title	**Prescribe therapies tailored to patients' needs and conditions**	
Description	This activity requires the ability to: • take and interpret medication histories • choose appropriate medicines based on an understanding of pharmacology, taking into consideration age, comorbidities, potential drug interactions, risks, and benefits • communicate with patients, families, and/or carers about the benefits and risks of proposed therapies • provide instructions on medication administration effects and side effects • empower patients and their carers to self-adjust medication doses and timing, where appropriate • understand differences between different continuous drug delivery devices, and assist patient choice • educate patients regarding the use of drug delivery devices and optimising functionality in different settings • know how to operate and adjust settings on all available drug delivery devices with or without continuous glucose monitoring • monitor medicines for efficacy and safety • review medicines and interactions, and cease where appropriate • collaborate with pharmacists	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• identify the patients' disorders requiring pharmacotherapy • consider non-pharmacologic therapies • consider age, chronic disease status, lifestyle factors, allergies, potential drug interactions, and patients' and/or carers' preferences prior to prescribing new medications • discuss pregnancy planning and contraception, as appropriate, with adolescents with chronic diseases which impact pregnancy outcomes • prescribe therapeutic adjustments based on adherence, using a patient-centred approach to prescribing, tailored to patients' biopsychosocial needs and developmental stage • modify patients' medications perioperatively • plan follow-up and monitoring	• be aware of potential side effects and practical prescription points, such as medication compatibility and monitoring in response to therapies • select medicines for common endocrine conditions appropriately, safely, and accurately • demonstrate an understanding of the rationale, risks, benefits, side effects, contraindications, dosage, and drug interactions • identify and manage adverse events

Communication	• discuss and evaluate the risks, benefits, and rationale of treatment options, making decisions in partnership with patients and their family or carers • write clear and legible prescriptions in plain language, and include specific indications for the anticipated duration of therapy • demonstrate dosing and include written instructions, and ask the patient, parent, or carer to demonstrate where required • educate patients and their carers about the intended use, expected outcomes, and potential side effects for each prescribed medication, addressing the common, rare, and serious side effects at the time of prescribing, to improve patients' adherence to pharmacotherapy • describe how the medication should and should not be administered, including any important relationships to food, time of day, and other medicines being taken • educate patients and their carers on correct self-administration of medications when using specialised devices • outline strategies to assist with children taking unpalatable medicines • ensure patients' and carers' understanding by repeating back pertinent information, such as when to return for monitoring and whether therapy continues after this single prescription • identify patients' and carers' concerns and expectations, and explain how medicines might affect their everyday lives	• discuss and explain the rationale for treatment options with patients, families or carers • explain the benefits and burdens of therapies, considering patients' individual circumstances • write clearly legible scripts or charts using generic names of the required medication in full, including mg / kg / dose information and all legally required information • ensure time of medication administration is accurate for all medications, particularly for those that are time sensitive • seek further advice from experienced clinicians or pharmacists when appropriate
Quality and safety	• review medicines regularly to reduce non-adherence, and monitor treatment effectiveness, possible side effects, and drug interactions, ceasing unnecessary medicines • use electronic prescribing tools where available, and access electronic drug references to prevent errors caused by drug interactions and poor handwriting • encourage the use of medication aides to facilitate adherence, where applicable	• check medication doses before prescribing • check that the administration timing for prescribed medications is accurately and clearly documented • monitor side effects of medicines prescribed • identify medication errors and institute appropriate measures • use manual and/or electronic prescribing systems safely • rationalise medicines to avoid polypharmacy

	• prescribe new medicines only when they have been demonstrated to be safer or more effective at improving patient-oriented outcomes than existing medicines • participate in clinical audits to improve prescribing behaviour • identify medication-related adverse events, and develop protocols to minimise medication-related adverse events in hospitals • report suspected adverse events, and record them in patients' medical records	
Teaching and learning	• use continuously updated software for computers and electronic prescribing programs • ensure patients understand management plans, including adherence issues • use appropriate guidelines and evidence-based medicine resources to maintain a working knowledge of current medicines, keeping up to date on new medicines	• undertake continuing professional development to maintain currency with prescribing guidelines • undertake continuing professional development to maintain up-to-date knowledge of new medications and the evidence for their use • reflect on prescribing, and seek feedback from a supervisor
Research	• critically appraise research material to ensure any new medicine improves patient-centred outcomes more than older medicines, and not just more than placebo • participate in research of new therapeutics • obtain informed consent from participants by informing patients about their rights, the purpose of the research, the procedures to be undergone, and the potential risks and benefits of participation • ensure that usual care is not compromised if patients decline participation in research • ensure that any protocol for human research is approved by a human research ethics committee, in accordance with the national statement on ethical conduct in human research • use sources of independent information about medicines that provide accurate summaries of the available evidence on new medicines	• make therapeutic decisions according to the best evidence • recognise where evidence is limited, compromised, or subject to bias or conflict of interest • allow patients to make informed and voluntary decisions to participate in research
Cultural safety	• explore patients' understanding of and preferences for non-pharmacological and pharmacological management	• appreciate patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of pharmacological

	• offer patients effective choices based on their expectations of treatment, health beliefs, and cost • interpret and explain information to patients at the appropriate level of their health literacy • anticipate queries to help enhance the likelihood of medicines being taken as advised • ensure appropriate information is available at all steps of the medicine management pathway • offer approved patient information resources in languages other than English, where these are available	and non-pharmacological management approaches
Ethics and professional behaviour	• provide information on medication to patients about: » how to take the medicine » potential side effects » what it does » what it is for » when it should be stopped • make prescribing decisions based on good safety data when the benefits outweigh the risks involved • demonstrate an understanding of the ethical implications of pharmaceutical industry-funded research and marketing • prescribe according to best evidence-based practice and in partnership with patients, and without undue influence from pharmaceutical industry interactions	• consider the efficacy of medicines in treating illnesses, including the relative merits of different non-pharmacological and pharmacological approaches • follow regulatory and legal requirements and limitations regarding prescribing • follow organisational policies regarding pharmaceutical representative visits and drug marketing
Judgement and decision making	• use a systematic approach to selecting treatment options • use medicines safely and effectively to get the best possible results • choose suitable medicines only if medicines are considered necessary and will benefit patients • prescribe medicines appropriately to patients' clinical needs, in doses that meet their individual requirements, for a sufficient length of time, with the lowest cost to them • evaluate new medicines in relation to their possible efficacy and safety profile for individual patients	• recognise personal limitations, and seek help in an appropriate way when required • consider the following factors for all medicines: » cost to patients, families, and the community » funding and regulatory considerations » generic versus brand medicines » interactions » precautions and contraindications » risk-benefit analysis
Leadership, management, and teamwork	• interact with medical, pharmacy, and nursing staff to ensure safe and effective medicine use	• work collaboratively with pharmacists • participate in medication safety and morbidity and mortality meetings

Health policy, systems, and advocacy	• choose medicines in relation to comparative efficacy, safety, and cost-effectiveness against medicines already on the market • prescribe for individual patients, considering history, current medicines, allergies, and preferences, ensuring that health care resources are used wisely for the benefit of patients • advocate for patients' access to medications that would be of benefit to their condition from evidence-based clinical assessments and judgement, when necessary	• prescribe in accordance with the organisational policy • prescribe in accordance with the pharmaceutical benefit scheme

Learning goal 11: Investigations and procedures

Theme	Investigations and procedures	
Title	**Select, organise, and interpret investigations, and plan, prepare for, perform, and provide aftercare for important practical procedures**	
Description	This activity requires the ability to: • select, plan, and use evidence-based clinically appropriate investigations • prioritise patients receiving investigations (if there is a waiting list) • evaluate the anticipated value of investigations, and only order investigations with appreciable benefit (e.g., those which are likely to change management) • work in partnership with patients[6], their families or carers to facilitate choices that are right for them • manage patients undergoing investigations to minimise risks and maximise diagnostic yield • interpret the results and outcomes of investigations • communicate the outcome of investigations and procedures to patients and their family or carers, and discuss the next steps • select appropriate procedures in partnership with patients, their families or carers • obtain informed consent • perform procedures using appropriate equipment and techniques • manage unexpected events and complications during and after procedures • provide aftercare for patients	
Behaviours		
Professional practice framework Domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• choose evidence-based investigations, and frame them in the context of comprehensive clinical assessments • understand the accuracy, limitations, and indications of endocrine investigations, and remain abreast of developments and local expertise in the various domains of endocrine testing, including imaging, biochemistry, dynamic testing, and invasive investigations • provide appropriate care for patients undergoing dynamic and invasive endocrine investigations to minimise risk and maximise diagnostic yield • develop plans for investigations, identifying their roles and timing • assess patients' concerns, and determine the need for specific	• provide rationale for investigations • understand the significance of abnormal test results and act on these • consider patient factors and comorbidities • consider age and gender specific reference ranges where relevant • identify contraindications for, and complications of, dynamic and invasive endocrine investigations • assess patients, and identify indications for procedures • check for allergies and adverse reactions • consider risks and complications of procedures • interpret results of common diagnostic procedures • organise and document post-procedure review of patients

[6] References to patients in the remainder of this document may include their families and/or carers.

	investigations that are likely to result in overall benefit • recognise and correctly interpret abnormal findings, considering patients' specific circumstances, and act accordingly • recognise investigation results that may be erroneous or misleading, and understand the pathways for correcting these errors if required (such as discussing assay errors with the lab, or ordering further investigations) • liaise with colleagues and multidisciplinary teams to interpret findings in the context of specific patients when necessary • confidently and consistently perform a range of common procedures including, but not limited to, intravenous canulation, intramuscular injections, pump and continuous glucose monitor insertion • confirm the correct position / site / side / level on patients for planned procedures • recognise and effectively manage complications arising during or after procedures	
Communication	• explain to patients the potential benefits, risks, costs, burdens, and side effects of each option, including the option to have no investigations • use clear and simple language, and check that patients understand the terms used and agree to proceed with proposed investigations • identify patients' concerns and expectations, providing adequate explanations on the rationale for individual test ordering • confirm whether patients have understood the information they have been given and the need for more information before deciding • use written or visual material or other aids that are accurate and up to date to support discussions with patients • explain findings or possible outcomes of investigations to patients • give information that patients may find distressing in a considerate way	• discuss the indications, risks, benefits, and complications of investigations with patients before ordering investigations • explain the results of investigations to patients • arrange investigations, providing accurate and informative referrals, and liaise with other services where appropriate • explain the process of procedures to patients without providing a broader context

	• accurately document procedures in clinical notes, including informed consent, procedures performed, reasons for procedures, medicines given, aseptic technique, and aftercare	
Quality and safety	• identify adverse outcomes that may result from proposed investigations or procedures, focusing on patients' individual situations • participate in clinical practice audits to ensure best available evidence-based practice is offered • where appropriate, collaborate with colleagues and multidisciplinary teams to ensure investigations are accurate and of clinical value • discuss clinical incidents at appropriate clinical review meetings • initiate local improvement strategies in response to clinical incidents	• consider safety aspects of investigations and procedures • seek help with the interpretation of test results for less common tests or indications or unexpected results • perform investigations and procedures in accordance with the organisational guidelines and policies
Teaching and learning	• use appropriate guidelines, evidence sources, and decision-support tools • participate in clinical audits to improve knowledge of test sensitivity / specificity and relevance for diagnoses and screening • teach junior staff about evidence-based use of investigations • organise or participate in in-service training on investigations and procedures, including the use and interpretation of new technologies • provide specific and constructive feedback and comments to junior colleagues • initiate and conduct skills training for junior staff	• undertake professional development to maintain currency with investigation guidelines • participate in continued professional development • help junior colleagues develop new skills • actively seek feedback on personal techniques until competent
Research	• provide patients or carers with relevant information if a proposed investigation is part of a research program • obtain written consent from patients or carers if the investigation is part of a research program	• refer to evidence-based clinical guidelines • consult current research on investigations • demonstrate adherence to the principles of ethical research, including consent

	• understand that patient participation in research is voluntary and based on an appropriate understanding about the purpose, methods, demands, risks, and potential benefits of the research, and that patients may withdraw consent at any time	
Cultural safety	• understand patients' views and preferences about any proposed investigations, including handling, storage, and disposal of test samples, and the adverse outcomes they are most concerned about	• consider patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of proposed investigations or procedures
Ethics and professional behaviour	• remain within the scope of the authority given by patients (except for emergencies) • when necessary, discuss with patients how decisions will be made once an investigation has started, if the patient is not able to participate in decision making • respect patients' decisions to refuse investigations, even if their decisions may not be evidence-based or in their best interests medically • advise patients and carers of the potential costs of investigations, which patients may wish to clarify before proceeding • explain the expected benefits, as well as the potential burdens and risks, of any proposed investigation before obtaining informed consent or other valid authority • demonstrate an awareness of complex issues related to genetic information obtained from investigations, and subsequent disclosure of such information, and obtain documented informed consent from patients prior to proceeding with such investigations • comply with consent processes, privacy law, and professional guidelines to maintain patient confidentiality	• identify appropriate proxy decision makers when required • choose not to investigate in situations where it is not appropriate for ethical reasons • practise within current ethical and professional frameworks • practise within one's own limits, and seek help when needed • involve patients and carers in decision making regarding investigations, and obtaining the appropriate informed consent, including financial consent, if necessary
Judgement and decision making	• evaluate the costs, benefits, and potential risks of each investigation in a clinical situation • liaise with colleagues and other members of multidisciplinary teams, providing clinical context to investigation outcomes when necessary	• choose the most appropriate investigation for the clinical scenario, in discussion with patients • recognise personal limitations, and seek help in an appropriate way when required

	• adjust the investigative path depending on test results received • consider the clinical impact if no tests are selected • adapt procedures in response to assessments of risks to individual patients	• assess personal skill levels, and seek help with procedures when appropriate • use tools and guidelines to support decision making
Leadership, management, and teamwork	• consider the role of other health professionals, and what other sources of information and support are available • ensure results are checked in a timely manner, taking responsibility for following up results and progressing management as appropriate based on these results • identify relevant management options with colleagues, according to their level of training and experience, to reduce error, prevent complications, and support efficient teamwork • coordinate efforts, encourage others, and accept responsibility for work done	• demonstrate an understanding of what parts of an investigation or procedure are provided by different doctors or health professionals
Health policy, systems, and advocacy	• select and justify investigations regarding the pathological basis of disease, appropriateness, utility, safety, and cost effectiveness • consider resource use through peer review of testing behaviours • use resources efficiently when ordering investigations or performing procedures	

Learning goal 12: Clinic management

Theme	Clinic management	
Title	**Manage an outpatient clinic**	
Description	This activity requires the ability to: • manage medical procedures and treatments • manage clinic services • keep appropriate written documentation of clinic attendance • oversee quality improvement activities • communicate with patients, their families, and/or carers • communicate with other health professionals • liaise with other health professionals and team members • demonstrate problem-solving skills • responsibly use public resources	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• effectively identify and address current clinical concerns, as well as longer-term clinical objectives, as appropriate to patients' context • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • create accurate and appropriately prioritised problem lists in clinical notes, or as part of ambulatory care review • maintain up-to-date documentation on patients' presentation, intercurrent health conditions, management, and progress, including key points of diagnosis and decision making to inform coordination of care	• demonstrate an understanding of the importance of prevention, early detection, health maintenance, and chronic condition management
Communication	• help patients navigate the healthcare system to improve access to care by collaboration with other services, such as general practitioners, community health centres, and consumer organisations • ensure patients understand the need for, and purpose of, a valid referral at each visit, and the duration of validity of the referral • link patients to specific community-based health programs and group education programs	• wherever practicable, meet patients' specific language and communication needs • facilitate appropriate use of interpreter services and translated materials • work in partnership with patients to develop agreed care plans and optimise motivation for adherence

	• use telehealth and digitally integrated support services to enable patients' access to care • update referring doctor / team of the attendance outcome and management plan in a timely manner, appropriate to the clinical situation of the patient	
Quality and safety	• practice health care that maximises patient safety • adopt a systematic approach to the review and improvement of professional practice in the outpatient clinic setting • identify aspects of service provision that may be a risk to patients' safety, and escalate appropriately • ensure that patients are informed about waiting times and any fees and charges	• take reasonable steps to address issues if patients' safety may be compromised • understand different ways to evaluate and improve the quality and safety of outpatient health care • participate in organisational quality and safety activities, including clinical incident reviews
Teaching and learning	• evaluate their own professional practice • demonstrate learning behaviour and skills in educating junior colleagues • obtain patients' consent before involving students or other health professional observers in patient consultations • contribute to the generation of knowledge • provide supervision to junior colleagues to ensure the provision of quality patient care • maintain professional continuing education standards	• recognise the limits of personal expertise, and involve other professionals as needed to contribute to patients' care • use information technology appropriately as a resource for modern medical practice
Research	• obtain informed consent before involving patients in research • inform patients about their rights, the purpose of the research, the procedures to be undergone, and the potential risks and benefits of participation before obtaining consent • ensure that usual care is not compromised if patients decline participation in research	• allow patients to make informed and voluntary decisions to participate in research
Cultural safety	• apply knowledge of the cultural needs of the community being served, and how to shape service delivery to its people • mitigate the influence of own culture and beliefs on interactions with patients and decision making • adapt practices which improve patient engagement and health	• acknowledge the social, economic, cultural, and behavioural factors influencing health, both at individual and population levels

	outcomes and are underpinned by cultural safety • identify and refer to, or engage, culturally appropriate support services for those with chronic health conditions	
Ethics and professional behaviour	• identify and respect the boundaries that define professional and therapeutic relationships • respect the roles and expertise of other health professionals • comply with the legal requirements of preparing and managing documentation • demonstrate an awareness of financial and other conflicts of interest	• understand the responsibility to protect and advance the health and wellbeing of individuals and communities • maintain the confidentiality of documentation, and store clinical notes appropriately • ensure that the use of social media is consistent with ethical and legal obligations • ensure appropriate consent procedures, and evaluate patients' capacity / competence to make decisions regarding their health care • use the legal framework for decision making and consent in paediatrics
Judgement and decision making	• triage referrals according to urgency of care required • integrate prevention, early detection, health maintenance, and chronic condition management, where relevant, into clinical practice • work to achieve optimal and cost-effective patient care that allows maximum benefit from the available resources • decide on the effective use of telehealth, outreach, and liaison services, when appropriate and where available	• understand the appropriate use of human resources, diagnostic interventions, therapeutic modalities, and health care facilities
Leadership, management, and teamwork	• prepare for and conduct clinical encounters in a well-organised and time-efficient manner • work effectively as a member of multidisciplinary teams or other professional groups • work effectively with patients' primary care providers • ensure that all important discussions with colleagues, multidisciplinary team members, and patients are appropriately documented • review discharge summaries, notes, and other communications written by junior colleagues, and provide feedback • support colleagues who raise concerns about patients' safety	• attend relevant clinical meetings regularly • identify causes of inefficiency in the clinic review process, and potential solutions • ensure all members of the multidisciplinary team are respectful of colleagues and interact appropriately and professionally

	• consider urgency of care, and work effectively to maximise patients' access to health services	
Health policy, systems, and advocacy	• demonstrate the capacity to engage in the surveillance and monitoring of the health status of populations in the outpatient setting • maintain good relationships with health agencies and services • partner with organisations to address aspects of service provision that may be a risk to patients' safety, such as overbookings, technology issues affecting efficiency, and clinic referral waitlists • apply the principles of efficient and equitable allocation of resources to meet individual, community, and national health needs	• understand common population health screening and prevention approaches • identify tools required to improve quality of service provision, and advocate for these within the health care organisation

Knowledge guides

Knowledge guides provide detailed guidance to trainees on the important topics and concepts trainees need to understand to become experts in their chosen specialty.

Trainees are not expected to be experts in all areas or have experience related to all items in these guides.

#	Title
13	Scientific foundations of endocrinology
14	Disorders of glucose metabolism
15	Disorders of body weight
16	Lipid disorders
17	Pituitary, hypothalamus, and electrolyte disorders
18	Thyroid disorders
19	Adrenal disorders
20	Parathyroid, calcium, and bone disorders
21	Endocrine oncology
22	Disorders of growth and puberty
23	Variations in sex characteristics and gender identity

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

For the statistical and epidemiological concepts listed, trainees should be able to describe the underlying rationale, the indications for using one test or method over another, and the calculations required to generate descriptive statistics.

Anatomy, histology, and physiology of the endocrine organs, such as:

- Adipose tissue
- Adrenal cortex
- Adrenal medulla
- Bone
- Female reproductive tract
- Hypothalamus
- Male reproductive tract
- Pancreas
- Parathyroid glands
- Pituitary gland
- Thymus gland
- Thyroid gland

Classes of hormones

- Structure, function, and biosynthesis of hormones:
  - » aminergic hormones
  - » peptide hormones
  - » steroid hormones

Mechanisms of hormone action

- Classes of nuclear hormone receptors
- Classes of peptide and aminergic hormone receptors
- Distinguish between autocrine, endocrine, and paracrine functions of hormones
- Principles of receptor signalling:
  - » G-protein coupled
  - » nuclear
  - » tyrosine kinase

Regulation of hormonal systems

- Key biosynthetic pathways of hormones:
  - » adrenal:
    - adrenal androgens
    - aldosterone / renin-angiotensin axis
    - catecholamines
    - cortisol / HPA axis
  - » calcium regulation and bone physiology:
    - bone turnover markers
    - calcitonin
    - fibroblast growth factor 23 (FGF23)
    - parathyroid hormone (PTH)
    - parathyroid hormone-related protein (PTHrP)
    - RANKL
    - vitamin D biosynthesis pathway
  - » hypothalamus / anterior and posterior pituitary axes:
    - ACTH, cortisol, CRH
    - arginine vasopressin

        - dopamine, prolactin
        - FSH, gonadotropin-releasing hormone (GnRH), LH,
          oestrogen, progesterone, testosterone
        - growth hormone (GH), GHRH, insulin-like growth factor 1 (IGF-1)
        - oxytocin
        - thyroid hormones, TRH, thyroid-stimulating hormone (TSH)
    - lipid metabolism
    - pancreatic and gastrointestinal hormones:
        - gastric inhibitory polypeptides (GIPs) / glucagon-like peptide (GLP), ghrelin, peptide YY
        - glucagon
        - insulin
        - somatostatin
    - reproduction:
        - activins, AMH, inhibins
        - HPG axes (FSH, GnRH, LH, oestrogen, progesterone, testosterone)
- Major stimuli and inhibitors of individual hormones
- Negative and positive feedback regulation of endocrine systems

Life stages

- Fetal endocrinology:
    - development of endocrine organs
    - growth and nutrition principles
    - role of placental and maternal hormones
- Neonatology:
    - endocrine function effects on birth size (either small or large
      for gestational age)
    - endocrine organs in postnatal physiology:
        - hypothalamic-pituitary-thyroid / adrenal / gonadal axis
        - mini-puberty of infancy
    - endocrine physiology:
        - full-term neonates
        - premature neonates
- Childhood:
    - growth and development principles:
        - normal variation
- Adolescence:
    - endocrine disease's effects on:
        - concerns and anxieties of parents / carers
        - neurodevelopment
        - physiology
        - psychology
        - social problems
    - hormonal maturation and development:
        - effects of chronic disease on normal endocrine development
- Transition to adult life:
    - chronic endocrine disease assessment and management

- chronic endocrine disease burden and the role of:
  - endocrine emergencies education
  - psychosocial support
- male and female gonadal maturation principles

Pharmacology

- Mechanism of action of major drug classes
- Ongoing management with these therapies
- Principles of pharmacology:
  - drug distribution, metabolism, and excretion
  - drug interactions, precautions, and contraindications
- Safe dose adjustments
- Side effects, and how to manage them
- Up-to-date, evidence-based best practice and clinical judgement
  to individualised medication management plans

Principles of statistics and epidemiology

- Basic statistics:
  - absolute and relative risk
  - confidence intervals, null hypothesis and P-values
  - likelihood ratios and odds ratios
  - power calculations, type I and II errors
  - sensitivity, specificity, and predictive values
  - statistical tests – ANOVA, chi-square, linear versus logistic regression analysis, parametric versus non-parametric t-tests
  - survival / ROC curves
- Clinical research studies:
  - case reports
  - cohort or registry studies
  - ethical principles
  - meta-analysis, scoping reviews, systematic reviews
  - observational studies
  - randomised control trials
  - study types, and advantages and limitations
- Levels of evidence and classes of recommendations
- Population risk determination of endocrine disease development:
  - biomarker development
  - community / policy prevention measures
  - principles of population screening
  - risk scoring systems

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and

Bone density and structure

- Densitometry investigations and limitations
- Quantitative CT assessment of bone density
- Quantitative bone ultrasound

Chemical pathology and laboratory testing of hormones

- Assay indications and limitations
- Assay interference – endogenous and exogenous parameters

physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

- General laboratory processes for sample collection, storage, and processing
- Physiological influences on hormone assay results:
  - » age
  - » circadian rhythm
  - » exercise
  - » fasting
  - » menstrual cycle
  - » pregnancy
- Reference ranges and how they are derived, including indications for:
  - » age-matched
  - » gestational reference ranges
  - » sex-matched
- Types of assays, such as:
  - » chemiluminescence
  - » colorimetric
  - » high performance liquid chromatography
  - » immunoassay
  - » mass spectrometry
- Sensitivity and specificity of testing choice

Cytology and histopathology

- Adrenal cortical tumours
- Adrenal medulla tumours and paragangliomas
- Gonadal histology – assessment of tumour risk with DSD, hormone secreting gonadal tumours
- Other endocrine and neuroendocrine tumours, including malignancy
- Parathyroid
- Pituitary
- Thyroid nodule FNA interpretation

Dynamic endocrine testing*

- Arginine stimulation test
- Assessment of disorders of glucose homeostasis
- Assessment of disorders of water homeostasis
- Assessment of glucocorticoid production
- Assessment of growth disorders
- Assessment of puberty disorders
- Clonidine stimulation test

Clonidine suppression test

- Combined protocols – consider timing and order of tests
- Combined tests
- Fasting study
- Glucagon stimulation test
- GnRH stimulation test
- HCG stimulation test
- Mixed meal test
- Oral glucose tolerance test
- Oral glucose tolerance test for GH excess
- Overnight high dose dexamethasone test

- Overnight low dose dexamethasone test
- Short synacthen test
- Short synacthen test with adrenal androgens
- Stimulated copeptin
- Water deprivation test

*suggest referencing Harmonisation of Endocrine Dynamic testing

Genetic testing

- For conditions where genetic testing is indicated, appropriate counselling and consent to be provided to patients prior to testing
- Role of microarrays, gene panels, targeted gene sequencing whole genome, and exome sequencing

Non-invasive tests and clinical assessment tools

- Diabetes management monitoring data:
  - ambulatory blood pressure
  - clinical risk assessment tools used with clinical judgment in the discussion of management with patients, such as monogenic diabetes calculator
  - continuous glucose monitoring output data
  - Ferriman–Gallwey scoring
  - insulin dose calculator applications
  - insulin pump upload data
  - manual or digital blood glucose level diary
  - Prader / external masculinisation score
  - salivary testing
  - Tanner staging
  - urine testing

Nuclear medicine

- Diagnostic utility of nuclear isotopes in endocrine disease, such as:
  - adrenal
  - bone scans
  - hyperinsulinism
  - neuroendocrine tumours
  - parathyroid
  - thyroid
- Therapeutic utility of nuclear isotopes in endocrine disease management, including radionuclide ablation

Radiological investigations

- Awareness and applicability of scoring systems for risk, such
  as thyroid cancer TiRADS scoring
- Bone age
- CT scan, including role for monitoring
- Functional PET scanning
- MRI:
  - adrenal
  - hypothalamus
  - pancreatic

	» pituitary » reproductive tract • Skeletal survey for skeletal dysplasias • Ultrasound assessment for parathyroid, puberty, and thyroid disorders
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis, management and outcomes.	• Endocrine medical emergencies • Evidence for best practice and its application, using clinical judgement, for individuals' circumstances, in partnership with patients • Incorporate environmentally sustainable practices in clinical care • Multidisciplinary care and review • Options for improving equitable access to comprehensive endocrine care for individuals, such as: » multidisciplinary involvement » resources appropriate to patients' language and cultural needs » use of telehealth and other digital health tools

Learning goal 14 – Disorders of glucose metabolism

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Asymptomatic with detection on screening
- Diabetic ketoacidosis
- Failure to thrive
- Fatigue
- Hyperglycaemia hyperosmolar state
- Hypoglycaemia in neonates and children
- Polydipsia
- Polyuria
- Visual changes
- Weight loss

Conditions

- Cerebral oedema
- Diabetes mellitus:
  - » cystic fibrosis-related
  - » drug induced:
    - chemotherapy
    - steroids
  - » monogenic
  - » neonatal
  - » type 1
  - » type 2
- Diabetic ketoacidosis
- Diabetes secondary to other conditions, such as:
  - » congenital absence of the pancreas
  - » pancreatectomy
  - » pancreatic insufficiency
  - » post-transplantation
  - » recurrent pancreatitis
- Hyperinsulinism:
  - » congenital
  - » permanent
  - » transient
- Hypoglycaemia:
  - » childhood
  - » neonatal
- Metabolic syndrome
- Pre-diabetes

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Conditions

- Atypical forms of diabetes
- Genetic syndromes of severe insulin resistance and/or insulin deficiency
- Rare syndromes associated with increased diabetes risk
- Total pancreatectomy and auto-islet transplant

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

Screening for diabetes complications and associated conditions

- Macrovascular complications:
  - » blood pressure
  - » lipids
- Microvascular complications
  - » nephropathy
  - » neuropathy:
    - autonomic (e.g. gastropheresis)
    - peripheral
  - » retinopathy
- Other associated metabolic screening, such as:
  - » fatty liver disease
- Other:
  - » diabetes distress
  - » myopathy
  - » obstructive sleep apnoea
  - » screening for disordered eating
- Additionally and specifically for Type 1 Diabetes:
  - » autoimmune adrenal insufficiency, including autoimmune polyglandular syndrome
  - » coeliac disease
  - » thyroid disease
- Diagnostic criteria
- Monitoring glycaemia:
  - » daily targets according to subtype of diabetes
  - » long-term targets:
    - glucose homeostasis
    - prevention / slowing of progression of diabetes and its complications with management, monitoring, and screening
  - » mean glucose
  - » time in range for continuous glucose monitoring

Insulin dose adjustments (irrespective of insulin delivery method)

- Safe dose adjustments in response to:
  - » alcohol and other drugs
  - » blood glucose levels
  - » exercise
  - » fasting
  - » nutrition

- perioperatively and periprocedurally
- sick days
- travel / flying

Treatments that impact blood glucose, such as glucocorticoids and parenteral nutrition

Lifestyle

- Counselling and best evidence-based lifestyle advice for individuals to manage all forms of established diabetes, and prevent the development of type 2 diabetes:
- Safe dose adjustments in response to:
  - alcohol / other drugs
  - carbohydrate counting
  - cardiovascular risk mitigation
  - contraception and pre-conception planning
  - education and employment
  - exercise
  - nutrition and diet
  - smoking / vaping
  - weight management

Pharmacological therapy

- Knowledge of the pharmacological therapy indicated for:
  - hyperinsulinism
  - monogenic diabetes
  - pancreatectomy or endocrine pancreatic insufficiency
  - type 1 diabetes mellitus
  - type 2 diabetes mellitus
- Mechanisms of action of major drug classes in:
  - hyperinsulinism:
    - diazoxide
    - somatostatin analogues
    - other
  - glycaemia:
    - effects of concurrent drug therapies on glycaemia
    - insulins
    - non-insulin injectable drugs
    - oral hypoglycaemic drugs
    - use of medications for evidence-based benefits beyond glycaemia in people living with diabetes
- Medication management plans
- Principles of pharmacology:
  - drug distribution, metabolism, and excretion
  - drug interactions, precautions, and contraindications

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and

Diabetes diagnosis screening

- Pancreatic autoantibody screening
- Genetic screening, and when it is appropriate for suspected inherited forms of diabetes
- Assessment of endogenous insulin reserve:
  - glucose
  - HbA1c, fructosamine
  - C-peptide
  - oral glucose tolerance test

physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Diabetes complication screening

- 24-hour urine collection for proteinuria quantitation
- Cardiovascular risk mitigation, such as:
  - » blood pressure management
  - » lipid management
  - » weight management
- Gastric emptying study
- Nerve conduction studies
- Retinal photographs
- Urine albumin/creatinine ratio
- Glucose data interpretation

Neonatal hypoglycaemia and hyperinsulinism

- Complication management:
  - » investigate for pancreatic exocrine insufficiency in cases where pancreatectomy is required
  - » screening for diabetes in the future
- Hypoglycaemia screening, such as:
  - » beta hydroxybutyrate
  - » cortisol
  - » free fatty acids
  - » glucose
  - » growth hormone
  - » insulin
- Use of imaging modalities, such as:
  - » MRI
  - » PET scans

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

Advanced technology and devices in diabetes management

- Blood glucose monitoring systems:
  - » benefits, data interpretation, and limitations:
    - Bolus calculators for multiple daily injection (MDI)
    - Coefficient of variation (CV) targets
    - mean glucose
    - time in range
  - » continuous glucose monitoring (CGM) systems:
    - concurrent with insulin pumps in manual mode or with automated insulin delivery
    - multiple daily injection (MDI) therapy
  - » finger prick meters – glucose and ketones
    - bolus calculators
- Continuous subcutaneous insulin infusion (CSII / 'insulin pump') therapy:
  - » calculation and adjustment of individuals':
    - basal insulin dose/rates
    - carbohydrate ratio
    - insulin sensitivity factor
  - » indications and suitability of CSII for an individual living with diabetes
- Insulin delivery devices:
  - » insulin pen devices for MDI therapy
  - » insulin pumps including automated insulin delivery

Evidence-based clinical practice

- Evidence for best practice and how it applies, using clinical judgement and individual circumstances in partnership with patients

- Principles, properties, indications for and limitations of beta cell transplantation, including whole pancreas or islet cell transplantation
- Principles, properties, indications for and limitations of immunotherapy agents for prolonging remission phase

General management considerations

- Educate, support, and empower people to self-manage their diabetes
- Environmentally sustainable practices in clinical care
- Equitable access to comprehensive diabetes care delivery for individuals, such as:
  - appropriate multicultural resources
  - multidisciplinary involvement
  - use of telehealth and other digital health tools
- Equity of access to education, employment, and government for access to diabetes technology
- Impact of a diagnosis of diabetes and of living with diabetes on an individual, their family, their life, and their life stages
- Impact of cultural, health literacy, social, geographic, and financial barriers to accessing comprehensive diabetes care
- Impact of hypoglycaemia unawareness on patients, their family, and carers
- Impact of socioeconomic determinants of health on health outcomes

Health needs of adolescents with diabetes

- Assessment for medical clearance for driving
- Common risk-taking behaviour in young people, and its effects on diabetes
- Counselling regarding alcohol and other drugs in the context of diabetes management
- Counselling regarding contraceptives and safe sexual practices
- Physiological, psychological, and social factors affecting glycaemia in adolescence
- Physiological, psychological, and social problems of glycaemic maintenance in adolescence, and the concerns and anxietieof parents and/or carers
- Potentially negative effects of adolescent behaviour on diabetes, and the impact it may have on family and personal relationships
- Practitioner's behaviour, and its impact on young people
- Transition adolescents to adult health care sensitively and safely

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations
Overweight or obese

- Acanthosis nigricans / Insulin resistance / T2DM
- Binge eating disorders
- Central hypoventilation
- Depression and other mental health issues
- Developmental delay
- Early onset obesity
- Hyperphagia
- Hypotonia
- Microphallus
- Neonatal hypoglycaemia
- Obstructive sleep apnoea
- Oligomenorrhoea
- Poor infant feeding
- Premature adrenarche / precocious puberty
- Prolonged jaundice
- Weight gain:
  - obesity
  - overweight

Underweight

- Delayed puberty
- Depression / Mental health issues
- Eating disorders
- Faltering weight
- Fractures / Osteopenia
- Malabsorption
- Oligomenorrhoea / Primary or secondary amenorrhoea
- Refeeding syndrome

Conditions
Overweight or obese

- Disorders of the leptin signalling pathway:
  - leptin deficiency
  - leptin resistance
  - MC4R mutations
  - POMC deficiency
  - proprotein convertase 1 (PC1) deficiency
- Endocrine causes:
  - Cushing disease
  - growth hormone deficiency
  - hypogonadism

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- recognise the clinical presentation
- identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- take a comprehensive clinical history
- conduct an appropriate examination
- establish a differential diagnosis
- plan and arrange appropriate investigations
- consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- provide evidence-based management
- prescribe therapies tailored to patients' needs and conditions
- recognise potential complications of disease and its management, and initiate preventative strategies
- involve multidisciplinary teams

Consider other factors

- identify individual and social factors and the impact of these on diagnosis and management

	» hypothyroidism • Exogenous obesity • Hypothalamic disease: » PWS » ROHHAD • Syndromic / Genetic causes, such as: » Albright's hereditary osteodystrophy » Bardet–Biedl syndrome » osteodystrophy » PWS **Complications of overweight / obese** • Dyslipidaemia • Fatty liver disease • Hypertension • Insulin resistance / T2DM • Polycystic ovary syndrome • Psychological **Underweight** • Eating disorders • Malabsorption: » coeliac disease » cystic fibrosis » inflammatory bowel disease • Malnutrition: » neglect » restricted diets due to autism / sensory processing issues » restricted diets due to multiple allergies **Complications of underweight** • Amenorrhoea • Nutrient deficiencies • Osteoporosis • Refeeding syndrome	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Bidirectional relationship of the gastrointestinal tract and brain in appetite and intake control and satiety • Epidemiology and prevalence of overweight / obesity and anorexia / underweight syndromes: » evidence basis for weight management strategies » evidence basis for weight regain avoidance in obesity » physical, endocrine, and mental health consequences of overweight / obesity, and similarly for the underweight syndromes » psychosocial factors that contribute to obesity and to underweight syndromes • Neuroendocrine regulation of appetite • Principles of body composition and energy balance • Recommended nutritional, micronutrient, and energy intake according to life stage: » athletes » post-surgical » sex, age, and pubertal stage	

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Cardiovascular risk mitigation

- Alcohol
- Blood pressure management
- Electrolyte derangement
- Kidney disease
- Non-alcoholic liver disease (NAFLD)
- Screening for:
  - » diabetes
  - » lipid derangement
  - » obstructive sleep apnoea and central apnoea
- Smoking / vaping

Clinical assessment

- BMI, body composition, height, weight, and plot on appropriate centile charts / assess SDS, waist circumference, waist-to-height ratio
- History taking and physical examination:
  - » clinical screening for factors that may predict endogenous obesity
  - » obesity-focused
  - » underweight syndrome-focused
- Screening for endocrine causes and consequences of weight derangement

Lifestyle

- Assessment of sleep hygiene and screening for obstructive sleep apnoea
- Counselling and best evidence-based lifestyle advice for individuals, as part of weight management strategy:
  - » dietary strategies for weight loss
  - » effectiveness
  - » evidence
  - » exercise – knowledge of relevant guidelines related to children
  - » maintenance
  - » manage patient medications safely
  - » menstrual issues
  - » normal growth and development
  - » nutrition, including use, prescription, and monitoring of VLEDs
  - » nutritional and supplementation management to avoid micronutrient deficiencies and bone loss
  - » precautions

Pharmacological therapy

- Pharmacological therapy available for overweight / obesity:
  - » contraindications and precautions
  - » expected effectiveness
  - » indications
  - » monitoring requirements – short-, medium-, and long-term
- Principles of pharmacology:
  - » drug distribution, metabolism, and excretion
  - » drug interactions, precautions, and contraindications

Procedures

Bariatric surgery referrals:

- » awareness of the evidence basis of various procedures
- » long-term management of people post-bariatric surgery:
  - ○ complication monitoring
  - ○ micronutrient supplementation, where indicated

- weight regain mitigation with knowledge of effective motivational, nutritional, and psychological strategies
  - » manage patient medication, specifically obesity and diabetes medications, perioperatively
  - » selective referral according to patient suitability

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

General management considerations

- Environmentally sustainable practices in clinical care
- Impact of culture and health literacy, and social, geographic, and financial barriers, to accessing:
  - » comprehensive eating disorder care
  - » comprehensive obesity care
- Impact of living with obesity or disordered eating on an individual, their family, their life, their psychological health, and their life stages, and the long-term management considerations
- Impact of socioeconomic determinants of health on an individual's health outcomes
- Options for improving equitable access to comprehensive weight management care for individuals, such as:
  - » multidisciplinary involvement
  - » resources appropriate to patients' language and cultural needs
  - » use of telehealth and other digital health tools

Health needs of specific groups

- Arrange appropriate referrals for management of associated conditions, including but not limited to:
  - » behavioural disorders
  - » orthopaedic (e.g., spinal)
  - » psychosis
  - » surgery
- Consider lifestyle measures in obesity prevention and management, such as:
  - » dietary
  - » environmental modifications
  - » physical activity
- Developmental delay
- Evidence for early screening and intervention for improved cardiovascular outcomes
- Impact of medications for mental health disorders on ability to comply with lifestyle advice, appetite, and body composition
- Management of hypothalamic / pituitary dysfunction, including but not limited to:
  - » growth hormone therapy
  - » hypogonadism, including pubertal induction and hormone replacement
  - » management of central hypothyroidism
- People living with mental health disorders
- Prader–Willi syndrome

Learning goal 16 – Lipid disorders

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Cascade, opportunistic, or universal screening
- Cutaneous xanthomas
- Dyslipidaemia – elevated cholesterol and/or triglycerides
- Family history of early coronary artery disease
- Pancreatitis

Conditions

- Genetic causes of hypertriglyceridaemia
- Heterozygous familial hypercholesterolaemia
- Secondary hypercholesterolaemia due to:
  - diabetes
  - hypothyroidism
  - liver disease
  - steroid treatment
- Secondary hypertriglyceridemia due to:
  - diabetes
  - side effects of medication, such as asparaginase

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Conditions

- Elevated lipoprotein
- Homozygous familial hypercholesterolaemia
- Sitosterolaemia

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- recognise the clinical presentation
- identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- take a comprehensive clinical history
- conduct an appropriate examination
- establish a differential diagnosis
- plan and arrange appropriate investigations
- consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- provide evidence-based management
- prescribe therapies tailored to patients' needs and conditions
- recognise potential complications of disease and its management, and initiate preventative strategies
- involve multidisciplinary teams

Consider other factors

- identify individual and social factors and the impact of these on diagnosis and management

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Incidence of familial hypercholesterolaemia and ethnic variations:
  - » early detection and multidisciplinary team management of severe lipid disorders
  - » genetics of familial hypercholesterolaemia and other inherited lipid disorders
  - » principles of cascade, opportunistic, and universal screening

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Investigations

- Cascade screening of family members
- Interpretation of genetic results
- Referral for cardiac / vascular investigations, especially in severe forms, including cardiac echo and carotid intimal media thickness
- Screening and monitoring of lipid profiles
- Screening for additional cardiac risk factors, such as:
  - » hypertension
  - » obesity
  - » smoking

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

General management considerations

- Access local guidelines regarding lipid screening, treatment options, and treatment targets
- Cascade testing
- Genetic counselling
- Multidisciplinary team approach, including:
  - » cardiology
  - » dietitian
  - » genetic counsellor
  - » primary care physician
- Recommendations for healthy lifestyle and cardiovascular risk mitigation, such as:
  - » diabetes
  - » hypertension
  - » obesity
- Shared care with primary care and general paediatrics
- Tertiary team approach for severe lipid disorders, including:
  - » apheresis service
  - » cardiology
  - » genetics
  - » liver transplant team
  - » metabolics

Non-pharmacological interventions

- Role of dietary measures, including plant sterols and omega-3 fatty acid supplements

Pharmacological interventions

- Acute management of severe hypertriglyceridemia with pancreatitis:
  - indications for use of heparin, insulin, and plasmapheresis
- Awareness of, and indications for, newer agents for severe forms:
  - ANGPTL3 monoclonal Ab
  - gene silencing agents
  - PCSK-9 inhibitors
- Dosing, indications, and side effects of:
  - cholesterol biosynthesis inhibitors (statins)
  - fibrates for hypertriglyceridemia and mixed dyslipidaemias
  - sterol uptake inhibitors (ezetimibe)
  - use of combination therapies and risks

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Abdominal pain
- Anosmia
- Dehydration
- Delayed or precocious puberty
- Dizziness
- Galactorrhoea
- Headaches
- Hypernatraemia / Hyponatraemia
- Hyperphagia / Anorexia
- Hypotension
- Nausea
- Neonatal hypoglycaemia
- Polyuria, polydipsia
- Short stature
- Visual loss or vision changes
- Vomiting
- Weight gain or weight loss

Conditions

- Pituitary lesions, such as:
  - craniopharyngioma
  - pars intermedia cysts
  - Rathke cleft cysts

Anterior pituitary hormone deficiencies

- Acquired pituitary hormone deficiencies:
  - craniopharyngioma and other space occupying lesions, such as germinoma and pilocytic astrocytoma
  - post-surgery
- Congenital hypopituitarism (multiple pituitary hormone deficiencies):
  - ectopic posterior pituitary
  - genetic causes of hypopituitarism:
    - HESX
    - PIT1
    - PROP1
  - interrupted pituitary stalk syndrome
  - septo-optic dysplasia
- Pituitary hormone deficiencies:
  - ACTH deficiency – central hypoadrenalism

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- recognise the clinical presentation
- identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- take a comprehensive clinical history
- conduct an appropriate examination
- establish a differential diagnosis
- plan and arrange appropriate investigations
- consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- provide evidence-based management
- prescribe therapies tailored to patients' needs and conditions
- recognise potential complications of disease and its management, and initiate preventative strategies
- involve multidisciplinary teams

Consider other factors

- identify individual and social factors and the impact of these on diagnosis and management

	» growth hormone (GH) deficiency » gonadotrophin deficiency (hypogonadotrophic hypogonadism) » Kallmann syndrome » thyroid-stimulating hormone (TSH) deficiency – central hypothyroidism • Prader–Willi syndrome **Disorders of pituitary hormone excess** • Cushing syndrome • Pituitary gigantism / acromegaly: » XLAG • Prolactinoma: » AIP » FIPA » MEN1 • Thyrotropinomas **Disorders of salt and water balance** • Arginine vasopressin deficiency (AVP-D) • Arginine vasopressin resistance (AVP-R) • Cerebral salt wasting (CSW) • Congenital or acquired: » germ cell tumour » Langerhans cell histiocytosis • Pontine myelinosis (rapid correction of chronic hyponatraemia) • Syndrome of inappropriate antidiuretic hormone secretion (SIADH)	
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Non-functioning pituitary adenomas** • Functional pituitary adenomas: » corticotropinomas secreting (Cushing disease) » somatropinomas secreting (acromegaly) » thyrotropinomas secreting • Pituitary apoplexy	

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Anatomy of hypothalamic-pituitary connections
- Causes and treatments for electrolyte, hypothalamus, and pituitary gland disorders
- Feedback systems for adrenal, gonads, thyroid, and growth hormone
- Functions of the hypothalamus
- Growth hormone's role in childhood and adult life
- Histology of the normal pituitary gland and of pituitary tumours
- Insulin-like growth factors' (IGFs') roles and their binding proteins in growth and differentiation
- Natural history of pituitary tumour types
- Normal and abnormal anatomy. embryology, and physiology of the hypothalamus and pituitary gland

Acromegaly

- Causes of elevated IGF-1
- Differentiate between excess growth hormone secretion from functioning pituitary tumour and that of secondary to excess growth hormone-releasing hormone
- Indication for pituitary imaging in acromegaly
- Properties of serum growth hormone and IGF-1 assays
- Somatostatin receptor subclasses, and relevance to therapeutics
- Somatostatin's role in negative regulation of somatotrope

Diabetes insipidus

- Desmopressin (DDAVP) pharmacology
- Differential diagnoses, including nephrogenic diabetes insipidus and chronic water excess (primary polydipsia)
- Loss of thirst regulation secondary to pituitary / hypothalamic disease and/or surgery
- Management principles of diabetes insipidus unmasked by cortisol and/or thyroid hormone replacement
- Primary causes, including genetics
- Regulation of salt and water balance, including regulation of free water clearance by cortisol and thyroid hormone
- Salt and water balance and limitations of measuring electrolytes, osmolality, and urinary specific gravity, and measurement of strict fluid balance
- Secondary causes and natural history of diabetes insipidus, including:
  - infiltrative disorders
  - metabolic cause
  - surgery
  - trauma
  - tumours

Prolactinoma

- The mechanism of differing dopamine agonists, particularly with respect to dosing and side effects
- The role of dopamine in negative regulation of lactotrophs

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Acromegaly

- Glucose suppression test for diagnosis of acromegaly
- IGF-1 assays
- Interpret glucose suppression test for diagnosis of acromegaly
- Properties of serum prolactin assays
- Serum growth hormone

Investigations

- Ophthalmoscopy of optic nerve
- Principles of and indications for imaging of the hypothalamus and pituitary:
  - CT scan
  - electrolytes
  - MRI
- Properties, principles, and indications for basal and dynamic biochemical investigation of hypothalamo-pituitary disease, including dynamic testing, such as:
  - corticotropin-releasing factor
  - glucagon / arginine
  - gonadotropin-releasing hormone (GnRH)
  - OGT for GH excess
  - overnight dexamethasone test
  - synacthen testing
  - thyrotropin-releasing hormone (TRH)
  - water deprivation and stimulated copeptin
- Visual field testing and more complex field testing

Procedures

- Clinical assessment of thyroid adequacy and over-replacement
- Pituitary irradiation and pituitary surgery
- Pre-, peri- and postoperative management of patients with pituitary disease, with emphasis on management of endocrine disturbances

Prolactinoma

- Indication for pituitary imaging in hyperprolactinaemia
- Properties of serum prolactin assays

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

- Causes and treatments for disorders of the hypothalamus and pituitary
- Differentiate between hyperprolactinaemia from functioning pituitary tumour versus ‘stalk effect’

Central hypoadrenalism

- Adrenal hormone replacement pharmacology
- Monitoring difficulties without feedback hormone
- Over-replacement signs
- Requirements for physical stress and illness
- Stress replacement and precautions

Central hypothyroidism

- Monitoring difficulties
- Over-replacement signs
- Thyroid hormone replacement pharmacology

Functioning pituitary tumours

- Treatments / pharmacology of dopamine agonists, including:
  - bromocriptine
  - cabergoline
  - lanreotide

- octreotide
- somatostatin analogues

GH deficiency

- IGFs' role and their binding proteins in growth and differentiation

Learning goal 18 – Thyroid disorders

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Asymptomatic incidental findings on blood tests or imaging detected on screening or routine surveillance
- Compressive symptoms
- Goitre
- Neck lump
- Ophthalmopathy:
  - » altered vision
- Systemic symptoms, such as:
  - » altered bowel habit
  - » altered mood
  - » fatigue
  - » gastrointestinal tract disturbance
  - » menstrual disturbance
  - » neonatal jaundice
  - » palpitations
  - » poor growth
  - » precocious puberty
  - » tachycardia
  - » tremor
  - » weight change

Conditions

- Graves ophthalmopathy
- Hyperthyroidism:
  - » autoimmune:
    - ○ Graves disease
    - ○ hashitoxicosis
  - » hot nodule
  - » medication-induced
  - » neonatal
  - » thyroiditis
- Hypothyroidism:
  - » autoimmune (Hashimoto disease)
  - » central (pituitary)
  - » congenital / neonatal
  - » hypothyroxinaemia of prematurity
  - » medication-induced
  - » thyroiditis
- Iodine deficiency
- Perioperative management of patients with thyroid disease

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

	• Thyroid hormone resistance: » thyroid hormone cell membrane transport defects (MCTB) » thyroid hormone receptor defects (THRB, THRA) • Thyroid cancer: » sporadic » syndromic • Thyroid nodule(s): » benign » functioning » malignant » non-functioning
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	• Advanced or recurrent thyroid cancer • Thyroid emergencies: » complications from anti-thyroid medications: o agranulocytosis o hepatitis » critically unwell patients presenting with concurrent thyroid derangement » patients presenting with myxoedema coma » patients presenting with, or at risk of, thyroid storm » Van Wyk-Grumbach syndrome
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Causes of hypothyroidism during and beyond the newborn period • Causes of permanent thyroid dysfunction in term and pre-term infants • Causes of transient hyper- and hypothyroidism in term and pre-term infants • Differences in thyroid function between premature and term infants • Regulation of iodine homeostasis and iodine deficiency • Risk factors for malignant thyroid disease, particularly radiation exposure • Risk factors for thyroid disease: » concurrent autoimmune disorders, such as autoimmune polyglandular syndrome type 1 or 2 » family history » medications, such as: o amiodarone o biological agents used to treat other conditions, such as malignancy o lithium • Thyroid autoimmunity • Thyroid hormone resistance and its clinical consequences • Thyroid replacement therapy and clinical follow-up in infants with congenital hypothyroidism
INVESTIGATIONS, PROCEDURES,	**Investigations** • Anti-thyroid medication and complications • Biochemical evaluation of the hypothalamic-pituitary-thyroid axis

AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	• Genetic testing for causes of congenital hypothyroidism, such as: » dyshomonogenesis » iodothyronine transporter defects » Pendred syndrome » thyroid dysgenesis » thyroid hormone resistance • Imaging: » nuclear medicine uptake scanning » staging imaging (CT / MRI) in patients with malignant thyroid disease » thyroid ultrasound » TIRADS risk stratification of nodules • Laboratory investigation of iodine deficiency • Newborn screening for hypothyroidism • Thyroid and bone age imaging in term and pre-term infants • Thyroid function tests • Thyroid replacement medication • Whole body radioiodine uptake **Referrals for procedures** • Radioactive iodine (RAI): » Graves disease » hot nodule(s), MNG, and thyroid cancer » risks, indications and contraindications, such as: ○ pregnancy ○ radiation exposure risk for pregnancy and young children ○ thyroid eye disease • Role of radio-iodine therapy in malignant thyroid disease • Thyroid nodule FNA (interpretation of histology) • Thyroid surgery when clinically appropriate
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	• Effects of non-thyroidal illness, particularly severe illness, on thyroid function and thyroid function tests • Emerging role of precision medicine and targeted treatments in childhood cancer • General principles of triage according to clinical presentation • Genetic causes of congenital hypothyroidism • Genetic counselling • Long-term follow-up of children with thyroid carcinoma, including risk of recurrence, monitoring, and risk of second malignancies • Long-term management of children following treatment for malignant thyroid disease, including thyroid-stimulating hormone (TSH) suppression, use of thyroglobulin, and monitoring for recurrence • Refer appropriately to endocrine surgeons and nuclear medicine specialists • Work with colleagues in chemical pathology, histopathology, nuclear medicine, obstetrics, pharmacy, thyroid surgery, and other doctors to deliver multidisciplinary input to patient care, as applicable to each case

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Atypical genitalia
- Cardiac arrythmia
- Electrolyte disturbance
- Fatigue
- Fractures
- Hirsutism
- Hypertension
- Hypotension
- Incidental adenoma
- Menstrual disturbance
- Metabolic syndrome
- Palpitations
- Sweating / Flushing
- Weight gain / Obesity
- Weight loss

Conditions

- Adrenal nodular disease:
  - » functional:
    - aldosterone-secreting tumours
    - catecholamine-producing tumours:
      - » paraganglioma
      - » phaeochromocytoma
    - Conn syndrome / hyperaldosteronism
    - Cushing syndrome / hypercortisolism
    - feminising tumours
    - virilising tumours
  - » non-functional:
    - macronodular adrenal hyperplasia
- Hypercortisolism:
  - » ACTH dependent
  - » ACTH independent
- Isolated glucocorticoid deficiency
- Primary adrenal insufficiency:
  - » adrenal hypoplasia congenita
  - » autoimmune:
    - Addison's disease
    - polyglandular autoimmune syndromes (APS 1, APS 2)
  - » congenital adrenal hyperplasia
  - » drug-related:
    - glucocorticoid use

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

	» idiopathic » infarction: o adrenal haemorrhage of the newborn » infection • Secondary adrenal insufficiency: » ACTH / CRH deficiency » ceased glucocorticoid therapy • Virilising or sex steroid excess syndromes	
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Conditions** • Adrenal cancer: » adrenal metastasis » primary • Inherited adrenal disorders: » isolated glucocorticoid deficiency: o familial glucocorticoid resistance o isolated mineralocorticoid deficiency o X-linked adrenoleukodystrophy	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	**Clinical science** • Anatomy and function of the sympathetic / parasympathetic ganglia • Anatomy, histopathology, and physiology of the normal and the abnormal adrenal gland (cortex and medulla) • Epidemiology and natural history of adrenal hormone excess disorders • Epidemiology of genetic predisposition to adrenal disease • Fetal adrenal gland development • Function and regulation of the adrenal gland • Hypothalamic-pituitary-adrenal axis • Prenatal treatment of CYP21 deficiency • Presentations of adrenal disease at different ages • Steroidogenesis pathway **Diagnostic workup** • Aetiology, clinical manifestations, and pathology of adrenal hormone deficiency, particularly hypercortisolism • Aetiology, clinical mandifestations, and pathology of adrenal hormone excess:	

- hyperaldosteronism
- hypercortisolism:
    - ACTH dependent:
- Cushing syndrome
- ectopic ACTH production
- iatrogenic
- nodular adrenal hyperplasia
- virilising tumours

- Genetic disorders affecting the adrenal gland
- History, physical examination, and diagnostic workup (laboratory and imaging studies) of people suspected of presenting with adrenal disease, particularly focusing on growth data
- Limitations, indications, and interpretation of biochemical assays in the diagnostic workup of adrenal disorders:
    - complex diagnostic workup and pitfalls in Cushing syndrome
    - diagnostic workup and pitfalls in hyperaldosteronism

Surgical and medical management considerations

- Emergency and long-term management of hypoadrenalism:
    - prescribing and monitoring of glucocorticoids and/or mineralocorticoids
    - screening for associated disorders
- Indications and need for surgical management in:
    - Cushing disease (transsphenoidal resection)
    - Cushing syndrome (adrenal tumour resection, adrenalectomy)
- Management of congenital adrenal hyperplasia and consideration of:
    - biochemistry to guide long-term management using androgen and renin levels, including capillary profiles over 24 hours of 17-hydroxyprogesterone
    - interpreting growth and development in the follow-up of congenital adrenal hyperplasia
    - other measures to guide management or treatment of congenital adrenal hyperplasia, such as:
        - ambulatory blood pressure monitoring
        - bone age
        - gonadotropin-releasing hormone (GnRH) analogue therapy
    - stress replacement of glucocorticoids and precautions
- Medical management of adrenal disorders of excess hormone production:
    - monitoring of treatment efficacy
    - monitoring of underlying condition
- Pharmacological principles of medications used in adrenal disorders and their requirements at different ages:
    - alpha receptor antagonists
    - glucocorticoid treatment (e.g., for chronic inflammatory diseases or malignancies)
    - mineralocorticoid receptor antagonists
    - mineralocorticoids and salt replacement
    - steroid biosynthesis inhibitors, such as ketoconazole, metyrapone, and mitotane

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Investigations

- Dynamic endocrine testing:
  - specific understanding of indications (and contraindications):
    - short synacthen test
    - workup for suspected Cushing syndrome, such as:
      - 24-hour urinary cortisol
      - dexamethasone suppression tests
      - midnight salivary cortisol testing
- Imaging:
  - adrenal ultrasound
  - CT adrenal protocol
  - functional PET imaging
  - MRI (with contrast)
  - other, such as inferior petrosal sinus sampling
- Laboratory biochemistry:
  - genotyping for CAH and interpretation for phenotype-genotype correlation
  - interpretation of biochemical testing in the clinical context
  - properties, principles, and indications for biochemical investigation of adrenal disease, including the hypothalamic-pituitary-adrenal axis:
    - baseline testing
    - dynamic testing
  - specific understanding of the timing, patient preparation, and assay platforms suited for adrenal hormone testing
- Less commonly performed tests, such as:
  - fludrocortisone suppression test
  - saline suppression test

Procedures

- Indications for adrenalectomy
- Indications for adrenal vein sampling
- Pre-, peri- and postoperative management of patients with adrenal disease, with particular emphasis on adrenal crisis and hypertensive crisis mitigation

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

Evidence-based practice

- Evidence for best practice, and applying this using clinical judgement and individual circumstances, in partnership with patients
- Multidisciplinary care / review from centres of expertise wherever necessary

General management considerations

- Clinical risk with intercurrent illness management planning when applicable, such as:
  - medical alert bracelet
  - sick day steroid plan
- Education of families regarding the time-course of polyglandular autoimmune disorders, including risk of Addisonian crisis
- Environmentally sustainable practices in clinical care
- Impact of adrenal disease and/or genetic diagnoses on the patient and their family or carers
- Long-term management of patients with adrenal disorders, including optimisation of growth, puberty, and quality of life measures
- Longitudinal and multidisciplinary care needs of people with adrenal disease

- Options for improving equitable access to comprehensive care for individuals, such as:
  - multidisciplinary involvement
  - resources appropriate to patients' language and cultural needs
  - use of telehealth and other digital health tools
- Pre-, peri- and postoperative management of patients with adrenal disease:
  - adequate glucocorticoid replacement in adrenal insufficiency and appropriate blockade in phaeochromocytoma
- Screening and genetic counselling of patients with inherited adrenal disease and referral of their family members, if appropriate, and with informed consent

Learning goal 20 – Parathyroid, calcium, and bone disorders

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Abdominal pain
- Acquired low bone mass
- Altered cognition
- Asymptomatic with incidental findings
- Bone pain
- Cardiac arrythmias
- Constipation
- Fractures
- Long bone deformities
- Nausea and vomiting
- Paraesthesia
- Renal stones
- Tetany and/or cramping

Conditions

- Bone disorders:
  - » osteoporosis:
    - primary, including osteogenesis imperfecta
    - secondary to other primary conditions or treatments:
      - » endocrine disorders
      - » infective or inflammatory conditions
      - » malignancy
      - » neuromuscular conditions
- Disorders of phosphate metabolism:
  - » FGF23 independent
  - » FGF23 mediated, such as XLH
- Hypercalcaemia:
  - » calcium-sensing receptor mutations
  - » hyperparathyroidism jaw-tumour syndrome
  - » parathyroid hormone-dependent hypercalcaemia – hyperparathyroidism:
    - hyperparathyroidism due to underlying genetic disorder:
      - » familial hypercalcaemic hypocalciuria

*For each presentation and condition, Advanced Trainees will **know how to:***

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

        - familial isolated idiopathic
        - MEN1
        - MEN2
      - primary
      - tertiary
    - parathyroid hormone-independent hypercalcaemia:
      - granulomatous disease
      - idiopathic infantile hypercalcaemia
      - immobility
      - malignancy-related osteolysis
      - milk-alkali syndrome
      - sarcoidosis
      - subcutaneous fat necrosis
      - vitamin D excess
    - Williams syndrome
- Hypocalcaemia:
  - calcium-sensing receptor mutations
  - hypoparathyroidism:
    - acquired
    - associated with genetic condition or syndrome:
      - 22q11 deletion
    - autoimmune polyglandular syndrome (APS) type1
    - congenital
    - post-operative:
      - parathyroidectomy
      - thyroidectomy
  - primary disorders of vitamin D metabolism and vitamin D receptor
  - pseudohypoparathyroidism
  - vitamin D deficiency
- Medication-related:
  - fibrous dysplasia:
    - McCune Albright syndrome
  - rickets:
    - calcipenic
    - phosphopenic

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Conditions

- Hypophosphataemia:
  - » acquired
  - » inherited
- Osteopetrosis
- Parathyroid adenoma / carcinoma

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

Inherited disorders / Disorders with a genetic basis

- Incidence and prevalence of conditions in the Australian population
- Recognise and screen for the possibility of known genetic variants causing pathology
- Referral for genetic counselling, wherever needed
- Screening for associated pathology in known inherited disorders
- Screening of family members, when indicated

Therapeutics

- Best practice and individualised approach of anabolic and anti-resorptive bone medications, including knowledge of benefits, indications, risks, and side effects
- Importance of taking preventative action to avoid or mitigate risk of adverse events from available pharmaceutical agents
- Management principles of:
  - » acute and/or severe hypercalcaemia
  - » hyperparathyroidism with medical therapies, when appropriate
  - » phosphataemic
  - » phosphophenic rickets, such as:
    - calcitriol
    - monoclonal antibody therapy
    - phosphate replacement
  - » vitamin D deficiency

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results

Clinical assessment

- Identify and refer patients for surgery where appropriate:
  - » provide perioperative care in patients undergoing parathyroid or thyroid surgery
  - » triage patients with indications for surgical intervention according to condition severity
- Monitoring disease activity
- Monitoring response to therapy

Imaging

- Bone mineral density, including:
  - » considerations for patient's age, pubertal stage, and size
  - » use of Z-scores, not T-scores, in children

of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	» usefulness and limitations • Localisation of parathyroid adenoma / cancer • Plain x-rays: » rickets » skeletal survey » pQCT • Renal ultrasound: » 4D CT » neck ultrasound for parathyroid disease » sestamibi scanning for parathyroid adenoma localisation **Laboratory tests** • 1,25 OH vitamin D level • 24-hour collections for urinary calcium: » spot calcium – creatinine ratio • 25 hydroxyvitamin D level • Bone-specific ALP • Bone turnover markers • Calcium – corrected and ionised • Electrolytes • FGF-23 • Genetic testing • Liver function tests • Magnesium • Parathyroid hormone (PTH) • Phosphate • Renal function • Screening for secondary causes of osteoporosis, including: » ACTH and cortisol » acute leukaemia » coeliac disease and other malabsorptive conditions » hypogonadism » TFTs • Urine phosphate – creatinine ratio and tubular reabsorption of phosphate (TRP)
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	**Evidence-based practice** • Evidence for best practice and application of this, using clinical judgement and individual circumstances, in partnership with patients **Management considerations** • Antenatal counselling • Conservative management according to individualised care • Counsel patients with up-to-date best practice guidelines for dietary, exercise, and lifestyle recommendations • Environmentally sustainable practices in clinical care • Genetic counselling • Incorporate a multidisciplinary approach to treatment, and refer appropriately • Understand the causes and treatment strategies (including preventative strategies) for children with a chronic condition impacting bone health

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Abdominal pain
- Diarrhoea
- Dizziness
- Dysphagia
- Dyspnoea
- Early / Precocious puberty
- Excessive sweating
- Fatigue
- Frequent urination
- Growth failure
- Gynaecomastia
- Headache
- Heart palpitations
- High blood pressure
- Increased thirst
- Localised pain / swelling
- Nausea
- Short stature
- Skin rash
- Stomach ulcers
- Visual disturbance
- Vomiting
- Weight changes

Conditions

- Craniopharyngiomas
- Endocrine effects of cancer treatment (see 'Important specific issues')
- Endocrinopathies associated with primary oncological presentations:
  - germinoma
  - Langerhans cell histiocytosis
  - optic gliomas and other suprasellar neoplasms
  - sex cord stromal tumours
  - testicular germ cell tumours
- Inherited tumour syndromes, including but not limited to:
  - Beckwith–Wiedemann syndrome
  - Carney complex
  - DICER1 mutations
  - Li Fraumeni syndrome
  - Lynch syndrome
  - multiple endocrine neoplasia:
    - type 1
    - type 2

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- recognise the clinical presentation
- identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- take a comprehensive clinical history
- conduct an appropriate examination
- establish a differential diagnosis
- plan and arrange appropriate investigations
- consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- provide evidence-based management
- prescribe therapies tailored to patients' needs and conditions
- recognise potential complications of disease and its management, and initiate preventative strategies
- involve multidisciplinary teams

Consider other factors

- identify individual and social factors and the impact of these on diagnosis and management

	» PTEN hamartoma syndrome » SDH mutations » Von Hippel-Lindau syndrome • Other solid tumours: » adrenocortical tumours » phaeochromocytomas » thyroid cancers	
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Conditions** • Neuroendocrine tumours: » carcinoid » gastrinomas » insulinomas	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Effects of treatment of cancer on the neuroendocrine system • Growth hormone-IGF-1 axis and the brain • End-organ, hypothalamic, and pituitary physiology and feedback systems for adrenal, gonads, growth hormone, and thyroid • Neuroendocrine control of appetite and satiety • Neuroendocrinology and the reproductive axis • Regulation of appetite and weight • Thyroid axis and the brain **Pharmacological therapy** • Classes of chemotherapy drugs and their endocrine effects (basic understanding of) • Gonadotropin-releasing hormone (GnRH) analogues • Hormone replacement therapy, such as: » desmopressin » glucocorticoid replacement » growth hormone replacement » pubertal induction and maintenance therapy: ○ oestrogen therapy – oral, transdermal ○ testosterone therapy – gel, intramuscular ○ use of gonadotrophin therapy » thyroxine replacement • Perioperative blockade for phaeochromocytomas: » pharmacological therapy perioperatively: ○ alpha and beta blockade ○ calcium channel blockers • Precision therapies and their endocrine effects (basic understanding of), including: » dopamine receptor agonists » prolactinomas » somatostatin analogues	

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Investigations

- Hormone stimulation tests (order and interpret), including basal and dynamic testing of pituitary function
- Pituitary MRI

Procedures

- Options for fertility preservation, including procedures such as:
  - oocyte harvest
  - ovarian tissue cryopreservation
  - semen analysis
  - testicular aspiration
  - testicular biopsy

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

Endocrine effects of cancer treatment

- Awareness of possible endocrinopathy associated with precision therapies, which remains in evolution:
  - CAR-T – autoimmune thyroid disease
  - monoclonal antibodies:
    - adrenalitis
    - autoimmune thyroid disease
    - hypophysitis
    - polyendocrinopathies
    - type 1 diabetes
  - small molecule kinase inhibitors – hypothyroidism
- Awareness of the interaction between other chemotherapy agents and endocrinopathies, such as:
  - PEG-asparaginase-hyperglycaemia
  - steroids:
    - AVN
    - fractures
    - hyperglycaemia
    - osteoporosis
- Complex late effects of cancer treatment
- Complications of alkylating chemotherapy, including:
  - primary gonadal failure and effects, as per radiotherapy below
- Effects and complications of radiotherapy by region of exposure:
  - cranial:
    - central adrenal insufficiency
    - central hypothyroidism
    - central precocious puberty
    - GH deficiency
    - hypothalamic / pituitary axis dysfunction
    - metabolic-like syndrome

- gonads:
  - primary ovarian insufficiency, including:
    - infertility / subfertility
    - premature menopause
    - pubertal delay / arrest
  - testicular failure, including:
    - infertility / subfertility
    - post-pubertal testosterone deficiency
    - pubertal delay / arrest
- thyroid:
  - primary hypothyroidism
  - thyroid nodules and carcinoma

- Endocrine complications of bone marrow transplant (note that complications of alkylating chemotherapy and total body irradiation also apply):
  - autoimmune thyroid disease
  - infertility / hypogonadism
  - metabolic syndrome
- Endocrine complications of neurosurgery:
  - pituitary (or nearby):
    - central diabetes insipidus
    - multiple pituitary hormone deficiencies (see KG 4)
- Potential for multiple areas of endocrine end-organ damage, and how the interaction between comorbid endocrinopathies can impact management, such as:
  - central precocious puberty with comorbid growth hormone deficiency
  - mixed central and primary gonadal failure
  - pubertal assessment in males after gonadotoxic therapies, and implications for clinical assessment and treatment
- Risk of infertility

Inherited cancer syndromes

- Implications of genetic testing and the principles of clinical genomics
- Screening guidelines for inherited cancer syndromes, and interpret investigations

Learning goal 22 – Disorders of growth and puberty

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Delayed puberty
- Gynaecomastia
- Hyperandrogenism
- Menstrual irregularity
- Precocious puberty
- Pubertal arrest
- Short stature
- Tall stature

Conditions

- Growth disorders:
  - » short stature:
    - intrauterine growth restriction (IUGR)
    - isolated growth hormone (GH) deficiency
    - GH resistance
    - multiple pituitary hormone deficiency
    - syndromal, such as:
      - » Down syndrome
      - » Noonan syndrome
      - » secondary to:
        - constitutional delay of growth and puberty
        - familial
        - other hormone disorders:
          - » Cushing syndrome
          - » hypothyroidism
    - Turner syndrome
    - under-nutrition
  - » tall stature:
    - familial
    - GH excess
    - syndromal, such as:
      - » Kleinfelter syndrome
      - » Marfan syndrome
- Puberty:
  - » central precocious puberty:
    - idiopathic
    - intracranial tumours:
      - » CNS infection or trauma
      - » craniopharyngioma
      - » glioma
      - » hamartoma

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

	» neurofibromatosis » tuberous sclerosis » early: o early normal variant puberty o premature adrenarche o premature thelarche » peripheral precocious puberty: o adrenal, such as congenital adrenal hyperplasia, tumours o delayed: » constitutional delay » primary gonadal failure » hypothalamic / pituitary disorders o exogenous sex steroids o obesity-related precocious puberty o ovarian – autonomous cysts, McCune Albright syndrome, tumours o testicular – familial male limited precocious puberty, tumours » polycystic ovary syndrome	
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Presentations** • Bone pain • Café au lait macules • Failure to thrive • Fibrous dysplasia • Fetal macrosomia • Galactorrhoea • Gynaecomastia • Hypoglycaemia • Ovarian cysts • Peripheral precocious puberty **Conditions** • Late effects of cancer treatment • McCune Albright syndrome • Prader–Willi Syndrome • Prolactinoma • Variations of sex characteristics	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of	**Growth disorders through different phases of human growth (fetal, childhood, and adolescence), and factors contributing to normal growth** • Constitutional delay: » appropriate follow-up » causes » growth and maturational pattern of constitutional delay • Effects of parental height in determining genetic height potential • Fetal macrosomia – causes and consequences	

the principles of the foundational sciences.	• Genetic and acquired causes of growth disorders • Intrauterine growth restriction (IUGR): » causes and consequences » definition of small for gestational age (SGA) » natural history » role and effects of growth, promoting treatment such as growth hormone • Normal variation in growth patterns, including constitutional delay in growth and puberty • Psychological effects of short stature and tall stature **Pharmacological therapy** • Advantages and disadvantages of various delivery systems for gonadal replacement • Agents used to slow epiphyseal maturation, such as aromatase inhibitors • Effects of therapy for other conditions which may affect growth and puberty, including chemotherapy and iron overload from recurrent transfusions • Knowledge of the pharmacological / hormonal therapy indicated for: » growth disorders: ○ constitutional delay of growth and puberty ○ GH excess ○ GH resistance ○ short stature – indications for growth hormone therapy, potential risks, and expected outcomes ○ tall stature » puberty disorders: ○ delayed puberty: » indications and options for pubertal induction ○ PCOS: » antiandrogen agents » metformin » oral contraceptive pill ○ precocious puberty: » long-acting gonadotropin-releasing hormone (GnRH) agonists **Puberty** • Actions of the main sex steroids: » adrenal » ovarian » testicular • Developmental and psychosocial effects of precocious puberty and delayed puberty • Difference between central and peripheral precocious puberty, and the investigation and management considerations for both • Early normal variant puberty, precocious puberty, and premature adrenarche / thelarche, and factors that affect their outcomes • Factors that regulate the onset of puberty • Investigations and management of hyperandrogenism • McCune Albright syndrome – genetics and mechanism of clinical manifestations • Normal development of the female and male reproductive system • Normal regulation of the hypothalamic-pituitary-gonadal axis • Normal stages of sexual maturation in neonatal infants, children, and adolescents • Presentations of hypogonadism in childhood, adolescence, and adulthood

- Principles of pubertal induction and ongoing gonadal replacement in males and females
- Pubertal suppression

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

Investigations

- Baseline laboratory investigations:
  - 25-Oh vitamin D, alkaline phosphatase, calcium, magnesium, parathyroid hormone, phosphate
  - adrenal androgen levels:
    - 17-hydroxyprogesterone
    - androstenedione
    - dehydroepiandrosterone sulphate (DHEAS)
    - progesterone
  - AFP, HCG (tumour marker)
  - anti-mullerian hormone (AMH)
  - blood film
  - coeliac serology, including IgA level
  - creatinine, electrolytes, full blood count, liver function tests, urea
  - growth hormone level, insulin-like growth factor 1 (IGF-1), insulin-like growth factor binding protein 3 (IGFBP3)
  - inflammatory markers:
    - C-reactive protein
    - erythrocyte sedimentation rate
  - inhibin B
  - iron studies
  - LH, FSH
  - oestradiol or testosterone
  - prolactin level
  - thyroid function (TSH, fT4, fT3)
- Dynamic hormone tests:
  - GnRH stimulation
  - growth hormone stimulation test
  - HCG stimulation
  - oral glucose tolerance test for GH excess
- Genetic investigations:
  - CGH array
  - directed molecular testing of relevant genes
  - karyotype
- Imaging:
  - brain MRI
  - pelvic ultrasound
  - x-rays (including bone-age x-rays)
- Urine tests:
  - urine metabolic screen
  - urine steroid profile

Clinical assessment tools

- Disease specific growth charts (e.g. Turner specific growth chart)
- Growth charts
- Height prediction tables
- Midparental height calculations
- Tanner staging of puberty
- Testicular volume estimation

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

Evidence-based clinical practice

- Evidence for best practice, and application of this using clinical judgement and individual circumstances, in partnership with patients

General management considerations

- Appropriate follow-up
- Educate, support, and empower people to self-manage their condition
- Environmentally sustainable practices in clinical care
- Impact of cultural, geographic, health literacy, financial, and social barriers to accessing comprehensive care
- Impact of a diagnosis on an individual, their family, their life, and their life stages
- Impact of socioeconomic determinants of health outcomes
- Options for improving equitable access to comprehensive health care delivery for individuals, such as:
  - multidisciplinary involvement
  - resources appropriate to patients' language and cultural needs
  - use of telehealth and other digital health tools
- Physiological, psychological, and social factors

Health needs of specific patient groups

- Counselling of patients and families regarding future fertility with certain conditions, such as Klinefelter syndrome and Turner syndrome
- Management of puberty in patients with special needs
- McCune Albright syndrome:
  - consequences of polyostotic fibrous dysplasia
  - evaluation of hormone excess
  - genetics
  - interpretation of dynamic endocrine testing for precious puberty
  - mechanism and clinical manifestations
  - presentation and interpretation of investigations in gonadotropin-independent precocious puberty
  - radiological investigations for fibrous dysplasia
  - risk of malignancy
  - typical appearance of skin lesions
- Multiple-pituitary hormone deficiencies
- Turner syndrome:
  - counselling of patients and families regarding:
    - endocrine and non-endocrine manifestations
    - long-term sequelae

Learning goal 23 – Variations in sex characteristics and gender identity

Advanced Training in Endocrinology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Ambiguous genitalia in neonates
- Bifid scrotum and hypospadias
- Bilateral cryptorchidism in males
- Delayed puberty
- Gender incongruence and/or dysphoria
- Gynaecomastia in male
- Labial fusion in female
- Palpable gonads in female
- Penoscrotal hypospadias
- Short stature
- Tall stature
- Undervirilisation in male
- Virilisation in female

Conditions

- Gender incongruence and/or dysphoria
- Congenital adrenal hyperplasia
- Turners syndrome
- Klinefelter syndrome

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Conditions

Differences of sex development (DSD)

- 46-,XX DSD
- 46-,XY DSD:
  - » complete gonadal dysgenesis
  - » defects in androgen action (CAIS,PAIS)
  - » defects in androgen biosynthesis
  - » disorders of AMH and AMH receptor
  - » gonadal regression
  - » LH receptor defects
  - » ovotesticular DSD
  - » partial gonadal dysgenesis
- Ovotesticular DSD:
  - » androgen excess (CAH, aromatase deficiency, maternal/exogenous
  - » gonadal dysgenesis
  - » testicular DSD
  - » other, such as:
    - cloacal exstrophy
    - MRKH
    - vaginal atresia

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

Assessment

- Assessment of capacity to consent to gender affirming hormone therapy, psychological/cognitive comorbidities and referral to mental health professionals for formal assessment of capacity when indicated
- Assessment of secondary sexual characteristics and genitals (when indicated for suspected variations of sex characteristics)
- Biological, cultural, and environmental contributions to gender identity
- Factors which may contribute to gender discomfort including:
  - puberty
  - sexuality
  - other psychological co-occurring conditions
- History, including gender development, treatment goals, and co-occurring conditions that may interact with gender affirming hormone therapy
- Understand the range of gender diversity

DSD

- Basis of gender assignment in DSDs
- Causes of sex chromosome 46,XY and 46,XX DSDs
- Counselling patients and families on the likelihood of fertility in individuals with DSDs, and the role of fertility preservation
- Genetic variations causing DSDs
- Natural history of DSDs
- Risks of gonadal malignancy in individuals with Y-containing chromosomes, and appropriate timing of gonadal biopsy and/or gonadectomy
- The need and timing of appropriate pubertal induction
- The process of human sexual differentiation
- The role of human sex chromosomes in sexual differentiation and DSDs

Variations in gender identity

- Biological, cultural, and environmental contributions to gender identity
- Factors which may contribute to gender discomfort, such as:
  - other psychological co-occurring conditions
  - puberty
  - sexuality
- The range of gender diversity and how they relate to:
  - gender dysphoria – the distress associated with a conflict between gender identity and anatomy or sex
  - transgender – gender identity differs from sex designated at birth

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure.

Investigations

- Biochemical investigations:
  - adrenal androgen levels
  - AMH and inhibin B interpretation
  - dynamic testing, such as:
    - gonadotropin-releasing hormone (GnRH) stimulation test
    - HCG stimulation test
    - synacthen
  - gonadotropin and sex steroids, including mini puberty interpretation
- Chromosomal investigations, such as:
  - FISH for Y material
  - karyotype
  - role and limitations of microarray
- DSD gene panels and interpretation of variants
- Histopathological markers of pre-malignant changes (interpretation of)
- Laparoscopic diagnostic modalities

Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.

- Radiological investigations:
  - ultrasound
  - MRI

Pharmacological therapy

- Indications for neonatal sex steroid treatment
- Indications and timing of appropriate pubertal blockade and induction
- Principles of pharmacology:
  - contraindications and precautions
  - drug distribution, metabolism, and excretion
  - drug interactions, precautions, and contraindications
  - expected effectiveness
  - indications
  - monitoring requirements – short-, medium-, and long-term

Procedures

- Multidisciplinary team discussion about the consent process for, indications, and timing of:
  - external and internal genital surgery
  - gonadal biopsy
  - gonadectomy

Variations in gender identity

- Assessment of secondary sexual characteristics and pubertal staging
- Investigations for variations in sex characteristics, including hormone profile and karyotype
- Non-pharmacological interventions, such as voice therapy and wearables
- Pharmacological interventions, in conjunction with psychological care:
  - anti-androgen medications, GnRH agonists, medications to suppress menstruation
  - role and timing of gender affirming hormone therapy
  - understanding the effect of puberty blockade based on timing of puberty
- Potential risks of pubertal suppression:
  - body composition
  - bone health
  - cost
  - fertility
  - impacts on growth
  - neurodevelopment
- Role of the multidisciplinary team in diagnosis and management:
  - diagnostic workup by psychological medicine and adolescent medicine physicians, including identification of treatment goals and co-occurring conditions
  - assessment by mental health professionals of capacity to consent to puberty blockade and/or gender affirming hormone therapy

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.

Differences of sex development

- Basis of gender assignment, including biological, cultural, and social factors
- Counselling regarding assisted fertility options
- Importance of coordinated multidisciplinary care and communication with patients, family, carers, and community providers
- Need for appropriate counselling of the family regarding genetic basis of the DSD, including availability of conception counselling, prenatal diagnosis and/or treatment and recurrence risk in siblings
- Need for full parental disclosure and staged disclosure to the individual at developmentally appropriate time points
- Psychosocial impact on patients, parents, and families
- Referring of families and individuals to peer support
- Roles within the multidisciplinary team to manage variations of sex characteristics, including:
  - clinical ethicist
  - general practitioner
  - geneticist
  - gynaecologist
  - paediatric endocrinologist
  - paediatric surgeon
  - paediatrician / neonatologist
  - psychologist

Variations in gender identity

- Culturally safe clinical environment for transgender and gender diverse people, such as gender identity, preferred names, and pronouns
- Differing and evolving national and international models of care for gender diverse youth
- Marginalisation faced by the transgender and gender diverse community, including barriers to accessing healthcare
- National and state-specific legislation regarding the prescription of gender affirming hormone therapy